

# Refrigeration Service Engineer

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No. 4

APRIL • 1936

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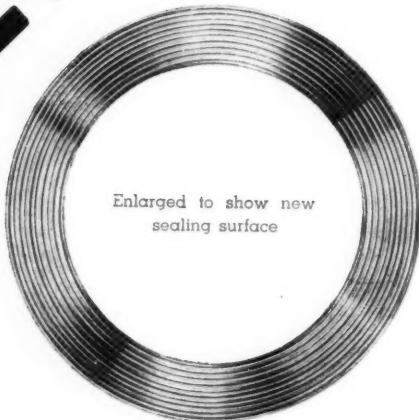
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Refrigeration Service Engineer  
Vol. 4, No. 4, April, 1936  
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Editorial and Technical Content  
Questions  
Answers  
Manufacturing Deviations

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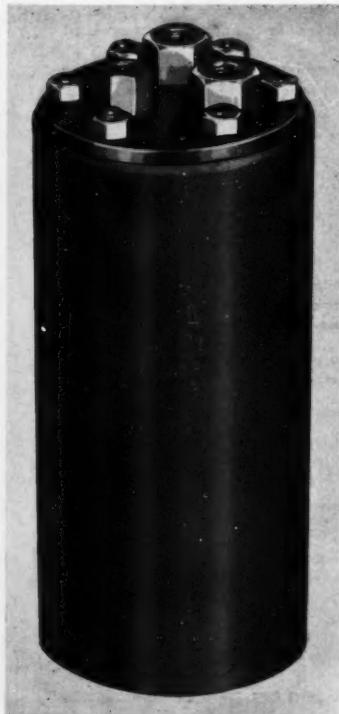
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# The REFRIGERATION SERVICE ENGINEER

*Devoted to the Servicing of  
REFRIGERATION UNITS and OIL BURNERS*

VOL. 4

APRIL, 1936

NO. 4

## COVER

THIS month's cover illustrates one of the modern refrigeration service shops in Memphis, Tenn. This shop is equipped to take care of all compressor repairs, grinding shafts, seating valves, baking oven, etc.

This refrigeration service shop is conducted by Mr. Boyd Evans of the United Refrigerator Supply Co. of Memphis.

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# The Refrigeration Service Engineer

*A Monthly Illustrated Journal Devoted to the Interests of the Refrigeration Service Engineer in the Servicing of Domestic and Small Commercial Refrigeration Systems and Oil Burners*

OFFICIAL ORGAN REFRIGERATION SERVICE ENGINEERS' SOCIETY

VOL. 4, NO. 4

CHICAGO, APRIL, 1936

\$2.00 per Annum

## Determination of Proper Charge in Air Cooled Units

By L. K. WRIGHT,  
Mem. A.S.R.E.

New Direct Reading Chart Provides Accurate Method  
of Determining Proper Refrigerant Charge for any  
Unit. Does Away With Former Hit-and-miss Method.

REFRIGERATION service men, especially those who work on independent service, are continually encountering old, strange or orphan units on which little or no data as to the proper refrigerant charge is available. Such units, as well as the hybrid type composed of odd pieces of apparatus assembled by reconditioners, are generally charged by the hit-and-miss method. At best, much time is wasted in attempting to get proper operation of such units.

As a rule service men check the refrigerant charge by the rough method in vogue for some years. This method is extremely crude in that while most household systems operate at nearly the same evaporator temperature, other applications work under widely divergent conditions and therefore cannot be as easily checked as in the case of the domestic type. It has been customary on household jobs to assume a room temperature to be somewhere between 60 and 90° F.

For checking household machine head pressures the service man using the old method would add or subtract a factor from the room temperature to obtain a rough idea of the correctness of charge and functioning of the equipment. A lower or higher head pressure would be taken to indicate incorrect operation.

With methyl chloride a factor of 15 would be added; for sulphur dioxide or Isobutane 15 would be subtracted, while in the case of "Freon-12" a factor of 50 would be added to the room temperature.

Such a determination was perforce hardly more than a guess and the service man would check other conditions to bolster this gleam of hope that the system was correctly charged and operating properly.

### New Method

The writer, after considerable research and experimentation, finally secured a sufficient mass of data which provided the requi-

site information on operating conditions of all types and models of household and small commercial units of the air cooled type to enable the working out of a chart.

This chart is direct reading, so that an air-cooled refrigeration unit can be checked by reference to it.

#### Determining Refrigerant

First, the refrigerant contained in the system to be checked must be determined. If no plates or tags indicating the refrigerant can be found on the base, crack the discharge service shut-off valve off its back seat and smell the gas coming from the service port, from which the pipe plug or other fitting has been previously removed to allow this escape of gas.

The sharp, pungent odor of sulphur dioxide is unmistakable. One sniff of the "sulphur-candle" smell is sufficient, even if the worker has a bad cold or is a rank tyro.

"Freon-12" and methyl chloride are practically odorless. Methyl chloride has a slightly sweeter odor than the almost undetectable "Freon-12." Light a match and hold it near the port. Be sure that just a faint quantity of gas is escaping. "Freon-12" will not burn, which serves to distinguish it from methyl chloride, for the latter will burn with a slight, lazy blue flame. If the valve is opened wider the flame will be blown out. If the valve is opened too wide while attempting this combustion test the methyl chloride may not ignite so it is important to have it open a mere trifle.

In many cases the refrigerant given on the tag has been replaced by some other. Be certain of the refrigerant, as otherwise an incorrect determination will result.

#### Determining Evaporating Conditions

Where a suction service valve exists attach a compound gauge (80 in. vac. to 60 lbs.) to the service port. This is best accomplished by putting a valve key on the stem and turning it in. If it is free, as in the case of a low side float system where a tee has been placed in the service port, one leg of which is connected to a pressurestat, or where the stem jumps off back seat, indicating the valve backseated, turn valve stem out all the way again until on its back seat. This cuts

off the service port, permitting removal of the pipe plug, or in the case of a tee being in the port, removal of the bonnet and nut, so that a gauge can be attached. Where a gauge test set is used by the service man the leg of the low side gauge port on the set is attached to the service port by means of a piece of  $\frac{1}{4}$  in. tubing.

By testing a service valve in the manner described the operator does not strain the stem, liable to result in breakage of same.

Most systems have suction service shut-off valves and by referring to the compound low pressure gauge attached as given previously the operating pressure can be determined.

#### Valveless Systems

Systems having no service ports, such as some of the cheaper or smaller household machines, where obviously no low side readings can be secured, may be roughly checked by placing a thermometer in the evaporator, preferably with the bulb in contact with or adjacent to one of the coil turns or tubes.

Cover the thermometer with a dry cloth and allow it to remain undisturbed for a period upwards of five minutes so that it may come to equilibrium.

It is preferable to make use of the pressure rather than the temperature condition, therefore wherever possible take the former reading. It is accurate, whereas the temperature reading gives the condition of the evaporator and not the true boiling temperature of the refrigerant. Temperature readings are sufficiently accurate, however, to provide the checking of valveless units, heretofore impossible to check.

#### Room Temperature

Hang a thermometer in the room in which the condensing unit is located to obtain the temperature of the air going over the condenser. In the case of self-contained jobs this reading cannot be incorrectly obtained but the operator is admonished to bear it in mind in the case where the high side is located in other quarters remote from the refrigerator, such as another room or basement.

Referring to the accompanying chart it will be observed that the central portion contains a series of curves labeled "Tem-

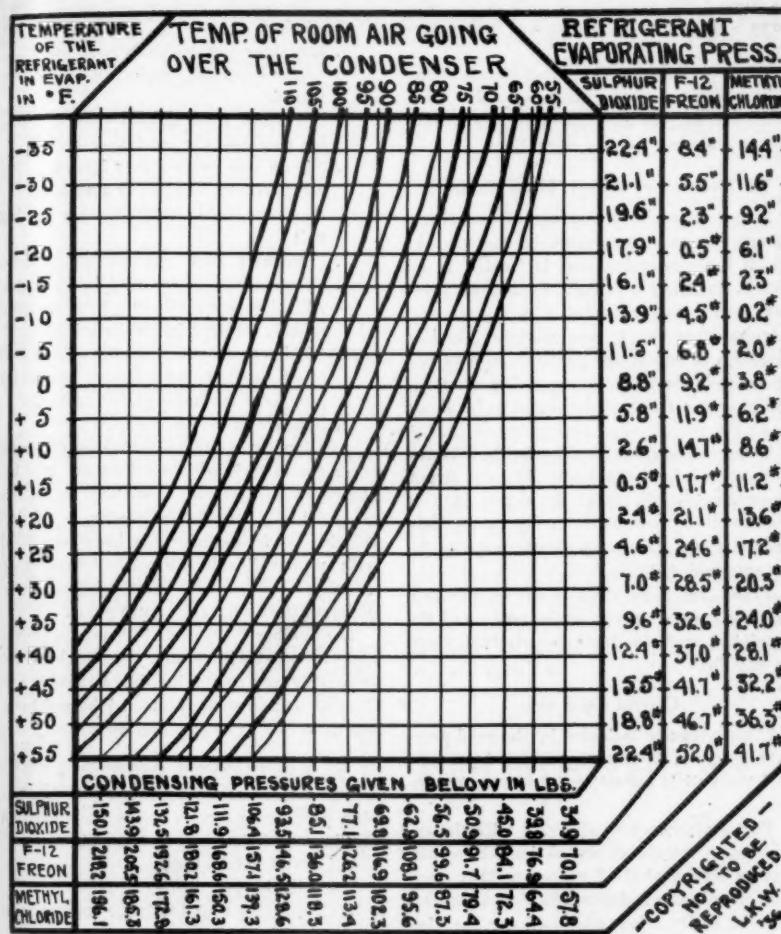


CHART TO DETERMINE CHARGE IN AIR COOLED UNITS

perature of Room Air Going Over the Condenser." These curves are arranged in five degree increments. In the event of the room temperature being one lying between two of the given curves the operator may take the reading midway for accurate determinations.

#### Refrigerant Temperature

The temperature of the refrigerant in the evaporator may be taken by means of a thermometer laid in the evaporator. As mentioned, this is not quite as accurate as data

secured by use of the pressure reading but in certain cases it will be the only convenient or possible means.

The refrigerant temperature column at the left hand side of the chart is the boiling temperature in degrees Fahrenheit.

#### Low Pressure Readings

Where possible secure a low pressure gauge reading. At the right hand side of the chart are listed pressure conditions for sulphur dioxide, "Freon-12" and methyl

chloride, given in inches of vacuum ("') and pounds pressure (#) per square inch gauge pressure.

These pressure readings correspond to the boiling temperatures given opposite each other and may be used for setting expansion valves and pressurestat operations.

#### To Determine Correct Head Pressure

As an example of the use of the chart, assume the air temperature of the room in which the condensing unit is located to be 65° F. and that reference to the low pressure gauge has indicated a 6 in. vacuum. Assume also the system contains sulphur dioxide. If no low side pressure reading can be secured the temperature of the evaporator in such a case will be found to be about + 5° F.

Using the temperature, but preferably the pressure reading of the low side, run finger along the 65° F. room air curve until it crosses the pressure or temperature line nearest proper condition; in this case 5.8 in. vacuum and + 5° F. line.

From this point drop down to the condensing pressure given at the bottom of the chart and read the pressure indicated, given as 62.9 lbs.

#### Correct Operation

If the pressure indicated by the head pressure gauge is 68 lbs., the charge is correct and the unit is operating in a correct manner.

Fortunately, nearly all units, with the exception of course of sealed jobs, have discharge service shut-off valves, so that pressure readings of the condensing pressures may be easily taken and used for checking operation.

#### Excessive Pressure Troubles

A variance of one pound either way is permissible. If more than this difference occurs the system needs checking. For instance, if above 64 lbs. in our example, say 66 or 70 lbs., the following conditions may be the cause of the excess pressure:

1. Excessive refrigerant or "overcharge"
2. Air in condenser
3. Dirty or fuzz bedecked condenser
4. Excessive oil in system

5. Fan blades bent or broken, blades missing
6. Improper fan design, wrong size
7. Motor reversed, causing fan to deliver less air
8. Condenser tight against wall, blocking air passage over condenser tubes
9. Air duct or louvers to or from machine compartment blocked or restricted
10. Evaporator too large for condensing unit
11. Condenser tube pinched by a blow, clogged with solder at joint, plugged with improper oil or piece of loose gasket, strainer in condenser plugged
12. Discharge service shut-off valve almost front seated or closed, partially plugged with loose gasket material
13. Mixture of refrigerant

Occasionally careless service men get some other gas in their service cylinders. For instance, in the last case mentioned in the list of previously mentioned causes, a methyl chloride service cylinder may have been filled with sulphur dioxide without first thoroughly cleaning the cylinder. Gas mixtures have different pressures from pure gases.

The number 10 cause is becoming a prevalent one, what with so many second hand refrigerator men combining the salvagable sections of several self-contained jobs and turning them out as overhauled apparatus.

#### Low Pressure Troubles

Where the pressure reading on the head or high pressure gauge is below the indicated reading the following are the main causes:

1. Loss of refrigerant
2. Undercharge
3. Condensing unit too large for evaporator
4. Suction line pinched by blow, plugged with solder or thick oil
5. Evaporator oil logged
6. Valve on coil not open wide

#### Interpolating

Where evaporating temperatures or low side pressures fall between any two given in the chart the operator can interpolate and follow across to the proper room temperature curve.

If the room temperature is one which falls between two given curves, use an imaginary

one properly located between the given curves.

In the case of the condensing pressure being indicated between two given pressures interpolate to obtain the head pressure. For instance, assume the determination to be one which lies between 132.5 lbs. and 148.9 lbs. Therefore, estimate as follows:

$$143.9 - 132.5 = 11.5 \text{ lbs.}$$

$$11.5 = 5 \text{ lbs. differential}$$

$$2.5 \text{ lbs. differential} = 11.5 \div 5 \times 2.5 = 5.75 \text{ lbs.}$$

$$132.5 + 5.75 = 138.4 \text{ lbs.}$$

Thus the head pressure indicated in this case would be 138.4 lbs.

#### Correctness of Chart

The chart method is extremely accurate and can be applied to any and all systems of the air-cooled type. It is especially valuable where an unknown or strange unit must be provided or recharged with refrigerant and where the original amount of charge is unknown.

There is no need to remove the low charge remaining in the system. All that is necessary is to add refrigerant by charging by the gas suction method into the suction service shut-off valve port. The suction service

shut-off valve must be front seated and a constant suction pressure held on the crank-case by means of the valve on the charging drum. Use a torch or pail of warm water to provide heat so the liquid refrigerant in the charging drum or cylinder will vaporize and so the pressure can be held at a definite charging pressure.

This charging pressure can be used as the back or evaporating pressure and the system charged until the head pressure is correct, as indicated by the chart. Then, leaving the charging cylinder attached, give the unit a trial run.

Operate machines at least 10 minutes before checking pressures. Read pressure existing on low side and also note head pressure at same time. In low side float, high side float and thermostatic systems the back pressure may drop before the operator determines the corresponding head pressure. Of course the head pressure will also have dropped.

Bear in mind the back pressure has a definite relation to the high side or head pressure. The higher the back pressure, the higher the head pressure. By the same token the higher the room temperature the higher the head pressure.

# Pressure and Temperature Controls

Operating differentials and ranges of Pressure and Temperature Controls. Details of construction and how they are actuated.

By GEORGE CLARK, B.S.M.E.\*

A **PRESSURE CONTROL** is a device for opening or closing a motor circuit in order to stop or start a refrigerating machine according to the pressure in the suction side of the refrigerating system.

The pressure type control consists in general of some type of snap switch mechanism which is operated by means of a combination of spring and metallic bellows which is

moved by a change in pressure on one side of the bellows. Since the evaporation temperature in the low pressure part of the refrigerating system determines the pressure in that part of the system, the temperature of the evaporating refrigerant may be controlled by regulating the pressure in the suction side of the system. As the machine is turned off and the evaporators warm up, the pressure of the refrigerant rises in the evaporators and as the temperature reaches

\* Detroit School of Refrigeration. Chairman National Educational and Examining Board.

the maximum desired temperature in the evaporator, the pressure in the suction line will be a definite pressure, depending on the refrigerant used and on the maximum allowable temperature in the evaporators.

In a multiple system only one control device is generally used to stop and start the refrigerator motor, although there may be any number of evaporators connected to the same machine. The pressure in the suction line then is determined by the refrigerant temperature in any evaporator; and the refrigerant temperature in all evaporators whose outlets are connected to the same suction line should be the same.

#### Toggle Switch

The type of switch used in pressure controls is often some sort of a toggle switch and in some instances the break is made definite by means of using a mercury tube as the switch. As the mercury tube tilts, the mercury breaks away from two contact points in the tube and opens an electrical circuit.

The electrical switches used in connection with pressure controls are generally of sufficient size and capacity to handle an electrical load of approximately 1 hp. For larger motors and in a good many instances in motors of a smaller size than 1 hp., a relay device is used in the electrical circuit in order to carry the heavy current required by the motor. In such a case the control switch passes a small current through a solenoid or magnetic coil of some kind to close the switch which actually carries the motor current. Various types of toggle action are used to make a definite break in the control circuit, as it is a definite requirement of a switch that the switch open quickly when it opens and close quickly when it closes; that is, there must be a snap action in the switch. If the switch did not have a snap action, as the pressure was reduced the switch would start to open; and if it opened slowly, the motor would stop and the suction pressure in the system would increase and the motor would immediately start again. Switches which are defective and operate in this manner cause a continuous stopping and starting of the motor which is detrimental to both the switch and the motor.

One type of switch uses a magnet to produce the desired snap action. A small horse-shoe magnet is located so that its field will be shortened as the contact bar of the control closes the circuit and its field will be lengthened as its contact bar opens the circuit and the contact bar is further removed from the magnet. The force exerted by the horse-shoe magnet on the contact bar is inversely proportional to the square of the distance between the magnet and the contact bar. As the pressure in the bellows or power element of the control is raised, the contact bar comes closer and closer to the magnet until such time as the distance between the contact bar and magnet is so small that the contact bar snaps closed and is held closed by the force exerted on the contact bar by the magnet. As the pressure in the suction line decreases, the force tending to open the contact is increased, but the magnet maintains contact until the force tending to open the contact is increased sufficiently to overcome the magnetic force when the contact snaps wide open and, being further removed from the magnet, the force between the contact arms and the magnet is very much decreased and the contact is wide open.

#### "Differential"

The difference between the pressure at which the control closes and the pressure at which it opens is referred to as the "differential" of the control. The lowest pressure at which it opens and the highest pressure at which it closes is referred to as the "range" of the control. The pressures at which it opens and closes at one setting may be referred to as the operating range. Thus, we might have a control having a range of 20 inches vacuum to 40 pounds pressure with a minimum differential of 5 pounds and a maximum of 20 pounds. Its operating range then could be adjusted to 10 inches vacuum to 10 pounds pressure, or from 10 pounds to 25 pounds as an operating range, in which case the control has a 15 pound differential. In most pressure controls both operating range and differential are adjustable.

The refrigeration control varies from a heating control in that an increase in pressure closes the switch and a decrease in pressure opens the switch, while the reverse is true of a heating control. Pressure controls

used in conjunction with water-cooled machines are most generally provided with a high pressure cut-out. The high pressure cut-out consists of a device which will open the control switch as the high pressure of the refrigerating system is increased to a point well above the normal operating pressure. The pressure connection to the high pressure cut-out of a control of this type is generally made to the high pressure vapor line, some place above the valve plate on the compressor and the liquid outlet of the receiver. The high pressure cut-out should be so hooked in that a stoppage in the liquid valve which will cause the pressure in the receiver and compressor to be increased, will operate the cut-out and stop the machine before any damage is done.

#### Liquid Line Connection

In a good many cases the high pressure cut-outs have been connected into the liquid lines of water-cooled refrigeration systems. When so connected the high pressure cut-out will operate if the reason for an excessive pressure is a lack of water supply which causes an increase in condensing pressure, or if there is an excess of refrigerant in the system; but if the liquid valve at the receiver is closed or plugged the pressure beyond this liquid valve will be reduced instead of increased, as it is in the receiver. In too many instances the pressure has been built up to a dangerous point in the receivers and in a great number of cases the ends have been blown out of receivers, causing a considerable amount of damage.

One type of pressure control has made use of a Bourdon tube such as is used in a pressure gage to tip a mercury tube or open the contact according to a change in pressure.

The pressure settings desired on a low pressure control depend on the refrigerant used in the system which the control is to regulate and the temperatures desired in the refrigerating system. In a multiple apartment house system, refrigerant temperatures from 10° to 25° are often desirable, which with methyl chloride will require a cut-out pressure of approximately 9 lbs. gage pressure and a cut-in pressure of approximately 18 lbs. gage. With sulphur dioxide, to ob-

tain the same operating temperatures a cut-off pressure of approximately 8 inches vacuum and 6 lbs. gage pressure cut-in will be required.

In a good many instances the cut-off pressure at the control is lower than might be indicated by the refrigerant temperature desired due to the fact that there may be a drop in pressure between the evaporator and the machine at which the pressure control is located. This drop in pressure occurs only when a considerable quantity of vapor is being passed through the suction line. The cut-in pressure is not affected by any drop in pressure through the lines.

Some pressure controls are so designed as to operate only at pressures above atmospheric pressure. Controls so designed are therefore not suitable for use with sulphur dioxide where moderate or low temperatures are required. Such controls are used in connection with methyl chloride and Freon as refrigerants. Controls which operate at pressures above and below atmospheric pressure are suitable for sulphur dioxide as well as the refrigerants which do not require such low operating pressures in order to obtain desired temperatures.

#### Temperature Controls

A *temperature control* quite generally consists of a pressure control attached to a thermostatic bulb by means of a small tube.

The pressure in the control switch is determined by the vapor pressure of the refrigerant at the surface of the liquid in the thermostatic bulb. Adjusting the pressures at which the control operates thereby adjusts the temperature at which the control operates when connected to a thermostatic bulb. The refrigerant to be used in the control bulb also determines the pressures which will be possible in the power element of the control for a given temperature.

The quantity of refrigerant charge in a control of this type is usually such that a small amount of liquid may be maintained in the thermostatic bulb, but the bulb will not be full of the liquid for a refrigeration control; or else the vapor pressure would be determined by the temperature of the liquid

at its surface which, with a full thermostatic bulb, would not be located in the bulb but some place in the power element itself.

A spring which varies the pressure at which the control operates may therefore be used as an adjustment on temperature and in conjunction with the usual type of control used on household refrigerating machines. This adjustment of the spring in the control is accomplished by turning a knob on the front of the control known as the "cold control" adjustment. Increasing the spring force will increase the operating temperature of the control, while decreasing the spring force lowers the operating temperature.

In a temperature control, the differential refers to the difference between the cut-in and cut-out temperatures of the control. The range refers to the temperatures of the maximum on-temperature to the minimum off-temperature. The differential as well as the operating range may be adjusted in the temperature control as it is in the pressure control. By "operating range" we refer to the on- and off-temperatures at which the control may be regulated. If a temperature control could be adjusted to cut out at a minimum temperature of  $-15^{\circ}$  and it could be adjusted to cut on at a maximum temperature of plus  $35^{\circ}$  and it was adjusted to turn off at  $5^{\circ}$  and turn on at  $20^{\circ}$ , we would say its differential is  $15^{\circ}$  and its operating range is  $5^{\circ}$  to  $20^{\circ}$  and its total range  $-15^{\circ}$  to  $+35^{\circ}$ .

#### Adjustment

In adjusting some types of controls, an adjustment of the cold control dial may raise the cut-on temperature but not affect the cut-off temperature. In other cases adjustment of the dial may affect the cut-off temperature but not the cut-on temperature. If this is the case, adjustment of the dial affects both the operating range and the differential. In some cases adjusting the control differential may raise the cut-on temperature and lower the cut-off temperature; or it may change only cut-on or cut-off temperatures.

This vapor pressure type of control is by far the most commonly used control in connection with household refrigerating machines and commercial systems where defi-

nite temperature regulation is required. In most cases the control is so designed that the pressure in the power element at operating temperatures is higher than atmospheric pressure so that if the refrigerant charge in the thermostatic bulb should leak out, the control would turn off and would not turn on again. Where a temperature control has lost part of its charge, with a low temperature in the bulb the pressure in the power element may lower sufficiently so that the control will turn off at the usual temperature; but with an increased bulb temperature the pressure will not be the vapor pressure of the refrigerant at that temperature as there will be no liquid in the bulb. When this occurs, the cut-on temperature of the control will be raised above normal.

#### Motor Protector

Household refrigeration controls often embody a motor protection device in addition to the temperature regulation device. This motor protection device usually consists of a small heater wire in series with the motor circuit. This heater coil or wire is placed around a shaft on which a small cog is soldered. A pawl fits on this cog and keeps the overload switch closed in normal conditions. As the motor becomes overloaded, the increased current through the heater coil heats the shaft and melts the solder and allows a spring to move the cog and pawl and open the motor switch. With the motor switch open and no current being passed through the heater coil, its temperature decreases and the cog resolders itself to the shaft. If the switch is reset by pushing in the switch on the front of the control, the pawl hooks on a new tooth of the cog and keeps the motor circuit closed again until a further overheating of the heater coil indicates an overloaded motor. In some cases the motor protection device may consist of a small heater wire placed close to a bi-metallic strip which warps with increased temperature and thereby opens the motor control circuit.

A defrosting arrangement on the household type of control in some cases has consisted in so regulating the operating temperatures as to cause the evaporator to warm up to a temperature considerably

above the frost temperature before the machine restarts during an off period. In some cases turning the dial of the control to a defrost or vacation position operates the machine long enough to cool the evaporator and freeze while the machine is operating, but allows the evaporator to defrost after the machine turns off. In other cases an auxiliary spring is used which for one cycle requires a temperature considerably above the normal cut-in temperature to start the machine and, after the machine is restarted, it continues to operate at normal temperatures. Thus when the switch is put in defrost position, the machine will stay off until the evaporator is completely defrosted on its next off period; but when the machine is again in operation, the control regulates at the usual operating temperatures. Some automatic defrosters now operate as a switch embodied in an electric clock which causes daily defrosting.

In addition to vapor pressure operated temperature controls, controls have been used having other principles of operation.

Among these are the bi-metallic strip controls and the freezing type controls. The bi-metallic strip control usually consists of a helical strip which is composed of two metals having different temperature co-efficients of expansion. Thus as the temperature increases, the outside metal may expand at a greater rate than the inside metal and consequently the helical coil tends to wind itself up. This may tip a mercury tube or operate contacts of a switch. Most generally in connection with refrigeration which requires a snap action control, it is used in conjunction with a mercury tube, as the break in the circuit in the mercury tube is in itself in the nature of a snap action switch.

#### Freezing Type Control

The freezing type control shown by Figure 1 consists of a bulb charged with some type of variable temperature freezing solution such as a weak solution of alcohol in water. As the temperature of the bulb is decreased sufficiently, the water begins to freeze in the bulb and the lower the temperature goes, the greater the quantity of water that freezes. Thus freezing causes an expansion in the bulb which operates through

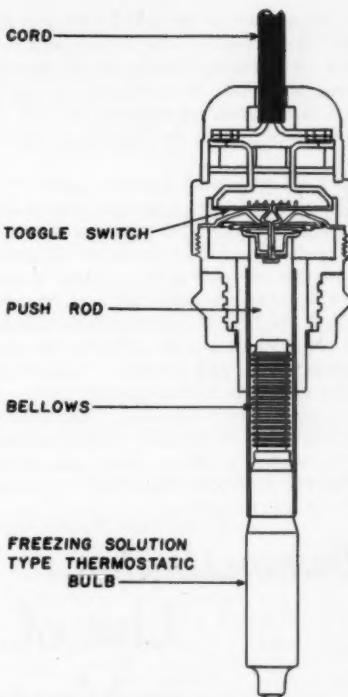


FIG. 1. FREEZING TYPE CONTROL

a small bellows to open a switch regulating the operation of the motor. As the temperatures decrease then with this type of control, the switch is moved to the open position by the expansion of the frozen liquid. The contraction caused by the melting of the ice in the bulb allows a spring to reclose the motor switch. Thus if a control of this type should leak and lose the charge of water and alcohol, it would not expand sufficiently when frozen to open the switch and this switch is of the type which we say is normally closed, that is, it requires the expansion of the freezing liquid to open it so that with this type of control the refrigerating system would operate continuously if the control lost its charge, while with the vapor pressure type of control we have a switch which we say is normally open and which is closed by the pressure of the refrigerant in the tube.

Vapor pressure controls which are to be used to regulate temperatures lower than

the temperature at the switch or power element may operate with a comparatively small thermostatic bulb and the refrigerant charge which may be very small as long as there is a liquid and vapor surface in the thermostatic bulb at the operating temperatures.

If a vapor pressure operated control were to be used where the operating temperature was higher than that of the control switch and power element, the charge of refrigerant in the control would have to consist of sufficient liquid to completely fill the power element at the control and the tube connecting the power element at the control to the thermostatic bulb, and provide a liquid and vapor surface in the thermostatic bulb.

If the control operating temperatures were to be above or below the temperature of the control switch, a power element and sufficiently large bulb would have to be used

and a sufficient charge would be required so that if the control power element temperature were lower than the bulb, the power element and connecting tube could be completely filled with liquid and still maintain a liquid and vapor surface in the bulb; and if the power element was at a temperature higher than the bulb, the bulb would have to be sufficiently large to hold the full charge of liquid in the control and maintain the liquid and vapor surface in the control bulb.

A great many of the temperature controls now being manufactured are "gas charged." That is, they are charged with a vapor at pressures above normal operating pressures but do not hold any liquid at the warm condition. When the temperature of the bulb is reduced to operating temperatures some of the vapor condenses into a liquid and the pressure is then dependent upon the temperature at the liquid and vapor surface.

## *Demonstrates*

# Use of Irritant Refrigerant in Vented Indirect System

New York Fire Department Is Shown Method of Eliminating the Alleged Panic Hazard in Air Conditioning.

OFFICIALS of the Fire Department of New York, including Mr. C. K. Michaels, Engineering Inspector, witnessed the demonstration prepared by the Virginia Smelting Co. at the Electrical Testing Laboratories, 80th Street and East End Avenue, on Wednesday morning, March 18th.

The Virginia Smelting Co. have in operation at the laboratories a commercial sized air conditioning system employing sulphur dioxide as a refrigerant and a spray type air washer for cooling and purifying the air.

The officials were shown that the total amount of sulphur dioxide being used in the apparatus could all be dumped rapidly into the cooling liquid or brine that is fed to the spray washer and that no odor of

sulphur dioxide, and no objectionable features, could be noticed in the air stream being conditioned and cooled.

They were shown that this air stream was not only cooled with resultant elimination of moisture, but that also body odors and carbon dioxide gas, which is emitted from the lungs as people breathe, were removed from the air by the treatment being given to it.

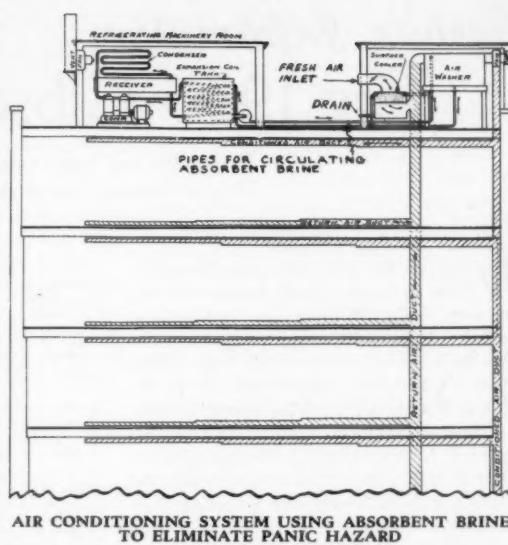
Fear had been expressed by Mr. Michaels that sulphur dioxide, if used in air conditioning, might create a panic hazard in case of a leak in the apparatus.

The demonstration apparently impressed Mr. Michaels and the other officials with the safety of an installation as suggested, and with the fact that it is possible to entirely

protect the public against the possibility of panic hazard by using cooling liquids or brines of the character demonstrated.

These liquids are alkaline or neutral even after sulphur dioxide has been dumped into them, and are not corrosive. Liquids of this nature have been used for this purpose purely because of their less corrosive nature compared with the cooling liquids commonly used.

Virginia Smelting Co. have now shown that these liquids have two advantages. They prevent panic hazard and they also reduce corrosive troubles. The company has recommended the adoption of an amendment to the proposed revision of the Code of Ordinances of the City of New York relating to refrigerating systems, which will permit the use, in any type of building, of an irritant or flammable refrigerant, provided the refrigerating equipment and the brine coolers are in a gastight engine room as defined in the Code, and provided further



AIR CONDITIONING SYSTEM USING ABSORBENT BRINE TO ELIMINATE PANIC HAZARD

that an absorbent brine is provided of such a nature and in such quantities that it can absorb at least twice the volume of refrigerant present in the system without itself becoming irritant or flammable.

## NEW BLYTHE CATALOG

THE H. W. Blythe Co., 2884 S. Michigan Ave., Chicago, have just issued their new 80-page wholesale catalog on refrigeration and air conditioning parts and supplies.

There are many new items of importance to the refrigeration trade. List prices are shown wherever possible, with a detachable confidential discount sheet for the use of the service company.

The products of nationally-known manufacturers which are listed include: American Injector; Ansul refrigeration gases; Imperial Brass Mfg. Co.; Kerotest Mfg. Co.; Henry strainers, dehydrators, ammonia valves and fittings; Rotary seals; Chieftain high-sides and compressors; Zerozone commercial high-sides; Fedders Mfg. Co.; Ranco and Penn controls; Detroit valves and controls; Alco valves; Mayson valves; Mercoid controls; Electrimatic valves; Gilmer belts; Hinsdale and Imperial tools; Prest-O-Lite

equipment; Murphy lacquers and enamels; Century motors.

A complete new line of Perfection certified compressor parts for Frigidaire, Kelvinator, Servel, Zerozone, King-Kold, Copeland and others is listed. All of these parts are of the highest quality and are carefully packaged for the trade. Mr. L. L. Rose (Rosey) is in charge of sales, assisted by Mr. Henry Zemanek and Mr. Bruce Hanson.

This new catalog will be sent to any legitimate service man upon request by writing H. W. Blythe Co., Chicago, Ill.

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G. H. Adams, California.

Thank you for reminding me regarding my subscription to the REFRIGERATION SERVICE ENGINEER. I am getting a lot of help from it and don't want to miss an issue.

B. K. Potter, Florida.

I am, what might be termed, an old-timer in the game, yet my subscription to the R. S. E. has paid me well in the many things I have found in the magazine.

# Service Information

## The 1936 Gibson Electric

### Description and Specifications of the Hermetic and Semi-Hermetic Models. Specifications and Servicing Information.

DURING the past few years there has been an increase in the number of compressors designed along the packaged or sealed unit type. This type is also known as the hermetic or semi-hermetic type. Some types of hermetic compressors are so designed that certain servicing operations may be made in the field, while other types require a factory exchange for replacement. It is desirable that the service man acquaint himself with the design and operating characteristics of this type of equipment because it may be expected that a number of service calls in the future will be received on equipment of this nature.

It is the intention of the editors of THE REFRIGERATION SERVICE ENGINEER to secure such authentic information for the service of our subscribers. This article will treat of the general operating and servicing suggestions of the Gibson 1936 hermetic and semi-hermetic machines, as recommended by the Gibson Electric Refrigerator Corp. of Greenville, Mich., in their service manual.

#### Specifications 1936 Hermetic Refrigerators

##### Compressor

Make—Gibson Twin Cylinder  
Type of System—Hermetic, no shaft seal  
Type of Compressor—Reciprocating Piston  
Compressor Drive—Direct Connected  
Compressor Speed—1750 R.P.M.  
Location of Compressor—Below Food Compartment

##### Evaporator

Make of Evaporator—Gibson  
Evaporator Construction—Plate and Boiler  
Metal Used—Heavy Electrolytically Tinned Copper  
Type of Refrigerant Control—High Side Float

##### Refrigerant

Refrigerant—Sulphur Dioxide  
Quantity in System—45-48 oz. depending on size.  
The SO<sub>2</sub> charge for the various models is as follows:

Model	Approximate amount of SO <sub>2</sub>
S-46	45 ounces
S-66	58 ounces
S-86	58 ounces
SD-646	58 ounces
CB & PCB-696	58 ounces
CB & PCB-796	58 ounces

##### Lubrication

Quantity in System—16 ounces  
Fan motor requires lubricating only once every three years

##### Condenser

Make of Condenser—McCord or Chase Brass  
Method of Cooling—Fan  
Type of Condenser—Finned Tube

##### Motor

Make of Motor—Delco or G.E.  
Type of Motor—Capacitor starting with automatic starting and overload relay  
Fan is operated by a small auxiliary motor

##### Control

Make of Control—Ranco  
Type of Control—Temperature  
Temperature Regulation—Twelve Points—Selective  
Light—Integral with Temperature Control  
How Defrosted—Semi-Automatic

#### Specifications—1936 Semi-Hermetic Refrigerators

##### Compressor

Make—Gibson Twin Cylinder  
Type of System—Conventional  
Type of Compressor—Reciprocating  
Compressor Drive—Direct Connected  
Make of Shaft Seal—Gibson  
Location of Compressor—Below Food Compartment

##### Evaporator

Make of Evaporator—Gibson  
Evaporator Construction—Plate and Boiler  
Metal Used—Heavy Electrolytically Tinned Copper  
Type of Refrigerant Control—High Side Float

##### Refrigerant

Refrigerant—Sulphur Dioxide  
Quantity in System—45-48 oz. depending on size.  
The SO<sub>2</sub> charge for the various models is as follows:

Model	Approximate amount of SO <sub>2</sub>
S-46	45 ounces
S-66	58 ounces
S-86	58 ounces
SD-646	58 ounces
CB & PCB-696	58 ounces
CB & PCB-796	58 ounces

##### Lubrication

Quantity in System—10 oz.  
Oil cups require lubrication only once every 6 months

##### Condenser

Make of Condenser—McCord or Chase Brass  
Method of Cooling—Fan  
Type of Condenser—Finned Tube

##### Motor

Make of Motor—Delco  
Type of Motor—Repulsion Induction

##### Control

Make of Control—Ranco  
Type of Control—Temperature  
Temperature Regulation—Twelve Points Selective  
Light—Integral with Temperature Control  
How Defrosted—Semi-Automatic

### Hot Wire Relay

In the 1936 Gibson hermetic a new type hot wire relay is used. The purpose of this mechanism is to start the motor and to give a positive protection against any possible overload and, further, to automatically start the motor mechanism after the overload has tripped. When the machine starts, both the starting and running winding contacts are closed. Between one and two seconds after the machine has started, the wire in the relay heats, thus expanding and lengthening the hot wire enough to break the starting winding. Should any overload be placed on the machine, the wire inside the relay will

current through the running winding will immediately heat the wire and break the running winding contact. It then requires between one and two minutes, depending on the room temperature, for the relay wire to cool, at which time the starting winding and then the running winding contacts are closed, and the machine starts. This operation should be kept in mind; otherwise, the operation of the machine under such conditions as described might be confusing. Fig. 1 illustrates the relay wiring diagram.

### Control

The Ranco type KR control made integral with the cabinet light is used on all 1936 Gibson refrigerators. The control used on hermetic units does not carry any overload mechanism and starting buttons will not kick out. The relay diagram (Fig. 1) gives overload protection to the hermetic motor. Gibson refrigerators equipped with the semi-hermetic units have controls with overload protection, and the control button will kick to the off position should the motor become overloaded for any reason. Fig. 2 is the wiring diagram showing the connections to control terminals used on both hermetic and semi-hermetic units.

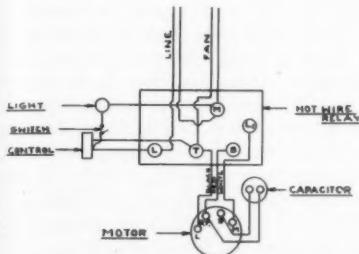


FIG. 1. RELAY WIRING DIAGRAM

heat further, and thus break the running winding contact, and no more current can pass through the hermetic motor. However, the fan motor will continue to run, thus lowering the head pressure, and in approximately one to two minutes, the relay wire will cool, and the hermetic motor will then start again. This entire operation is automatic, and the relay will continue to try to start the motor indefinitely.

It is also important to understand that when the machine is operating normally and the control button is pulled to the off position and immediately pushed back in again, the compressor will not start immediately. Only the fan motor will run. In explanation of the above, when the control button is pulled to the off position, the starting winding contact is open. When the button is pushed back in again, immediately the relay is in the same position (since it has not had time to change); that is, with the starting contact open and the running contact closed. Thus the machine will not start, and the

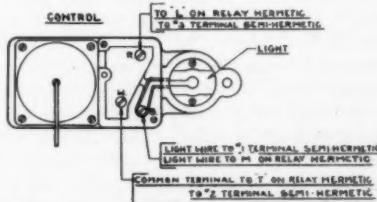


FIG. 2. WIRING DIAGRAM SHOWING CONNECTIONS TO CONTROL TERMINALS

The hermetic compressors are equipped with service plug valves. The shut-off valve on the receiver tank is of the conventional type. All semi-hermetic units are equipped with conventional type shut-off valves.

### Charging or Purging Valve

The connection on top of the float valve is a different type valve from the suction and discharge shut-off valves. Remove the protecting cap and screw on the purging valve. This valve should be tightened securely. See that the back nut around the stem is loosened approximately one-half turn. Turn

right, clockwise, until the stem fits into slot in valve. Then turn the valve stem in the opposite direction, counter clockwise, and the valve is open. In purging, or when the valve is left open for a short time, it is not necessary to retighten the packing nut

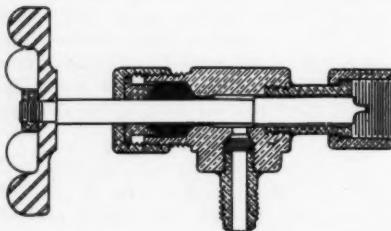


FIG. 3. CHARGING VALVE

around the stem. However, when discharging or charging the unit, or whenever the valve will be left open for sometime, this packing nut should be tightened. When charging or discharging the unit, have all joints tight. Then check for a possible leak.

#### Oil Trap

Always discharge a unit through an oil trap. A trap can be easily made up, consisting of cylindrical tube approximately six to ten inches long. The  $\text{SO}_2$  is admitted through a connection at the top, and the discharge tube is connected to the opposite side of the top, which allows the oil to drop to the bottom of the cylinder while the  $\text{SO}_2$  gas passes through. After the unit has been discharged, the oil lost in discharging can be drained from this cylinder and measured.

#### Discharging (If the Unit Will Run)

First connect the charging valve to the top of the float. Then connect the oil trap to this charging valve with a short piece of copper tubing. If vacuum pump is available, connect it to the other side of the oil trap. When valve on the top of the float is opened, the unit will start to discharge immediately. The unit should be run until all parts of the system are room temperature. The oil lost, if any, during this process should be carefully measured in order to determine the amount with which to recharge the unit.

#### Discharging (If the Unit Will Not Run)

When the unit will not run, it is necessary to connect a charging valve to both high and low side fittings. Both sides should then be connected to the vacuum pump through the oil trap or purged into a solution of lye water.

#### Charging With Vacuum Pump

Before charging with sulphur dioxide, see instructions above for adding oil. When a vacuum pump is available, connect pump to the top of the float by means of a charging valve and copper tubing, and draw a vacuum on the entire unit for a period of 20 minutes. At the same time, after making certain the compressor has sufficient quantity of oil in the crank case, start the unit and allow it to operate while the vacuum pump is in operation. Close the valve to the vacuum pump and open the valve to the bottom of the  $\text{SO}_2$  cylinder so that liquid sulphur dioxide is admitted instead of gas. It may be necessary to heat the  $\text{SO}_2$  cylinder to force the last of the charge into the unit. Care should be taken to watch the gauge so that pressure does not become excessive.

It should not be necessary to use more than 100 lbs. of pressure to charge the unit. When the proper amount of sulphur dioxide has been added, close the valve on the bottom of the container and heat the line to the unit in order to vaporize all liquid in this tube. Then close the valve at the top of the float and draw a vacuum on the connecting lines.

#### Charging Without Vacuum Pump

Before charging with sulphur dioxide, see instructions above for adding oil. If the shop is not equipped with a vacuum pump, proceed as follows to charge the unit with sulphur dioxide. Be sure the suction shut-off valve is tight to compressor in order that no air can be taken into the system. Then connect the charging valve to the top of the float and open this connection. Run the unit for a period of 20 minutes in which time all air will be expelled from the low side. Now connect the sulphur dioxide container to the charging valve and charge with the proper amount of sulphur dioxide.

It may be found necessary to heat the sulphur dioxide container to force the last of it into the unit. Always charge with liquid and not with gas. Always use pressure gauge on sulphur dioxide container to avoid overheating. When proper amount of sulphur dioxide has been added, shut off the valve at the bottom of the container and heat the line to the charging valve. Then close the valve at the top of the float and disconnect line to  $\text{SO}_2$  tank.

Now run the unit for a period of five minutes and then shut off for a period of two or three minutes. Slowly open the valve at the top of the float for two or three seconds to purge any possible air from the system. It is advisable to purge two or three times to eliminate all possible air. After charging the unit, a check should always be made for any possible leaks. After the unit has cycled several times, check the charge as follows:

#### Determining Correct Charge in Unit

Always make certain the refrigerator (especially the evaporator) is level before checking the charge. If the unit is undercharged, the motor may run continually or the overload may kick out. Check the frost line on the suction line under the evaporator to determine if it is frosted back to the solder joint with the capillary line. If the unit is overcharged, the suction line on the back on the cabinet will drip water or be frosted over during the time the motor is running. Purge the unit slowly through the valve on the float until this condition disappears. If a unit is greatly overcharged, the compressor will run continually and the suction tube and compressor near the suction tube inlet will be cool although the suction tube may not frost—depending on the amount of overcharge.

The proper charge is obtained when the frost line ends on the suction line between the evaporator and the solder joint.

*Important.* Do not operate the compressor without first making certain that sufficient oil is in the crank case.

#### Unit Undercharged

If the unit is undercharged, the ice cube trays on the left hand side of the Freez'r

Shelf may be slow in freezing. Check the left hand boiler under the Freez'r Shelf to see if the boiler defrosts during the off-cycle of the motor. On the "U" type evaporator, check the last boiler; that is, the boiler to which the suction tube leading back to the compressor is connected as this will be first to show a defrosted condition if the unit is undercharged. If this condition is found, sulphur dioxide should be added until the frost line appears on the suction tube as explained above under correct charge.

The refrigerator should be placed level before the charge is checked. The control and operation of the unit should also be checked along with the conditions given above for an undercharged unit.

#### Dehydrating Parts

Before attempting to replace any part of the refrigerating system, the new part should be at hand and ready to install. Never allow the system to be left open to the air for any length of time. If it is found necessary to leave the job after it has been started, always close any open lines. This is absolutely necessary in order to prevent air or moisture from entering the system.

#### Checking and Adjusting Thermostatic Control

To check the control temperature setting, a dial indicating thermometer should be used. Place the thermometer bulb directly against the control bulb and clamp tight with thermometer clamp. Figs. 4 and 5 illustrate how this is done. On the deluxe models, the ice tray selector baffle should be removed. This is done by pushing to the right and then pulling forward on the left end first. Remove any frost or ice in order to get good metal-to-metal contact between the bulb and the evaporator. After the control has been checked, make certain the control bulb clamp is again tightened securely in place. When the control temperature dial is set at the No. 1 position (it is necessary to check the temperature only at this one point), the unit should start at  $26^{\circ}$  F. and should stop at  $17^{\circ}$  F. Two degrees plus or minus can be allowed on either the cut-in or cut-out point.



FIGS. 4 AND 5. CHECKING CONTROL TEMPERATURE SETTING

Always check the thermometer before using for first time, and re-check at frequent periods, thereafter. Remember that dial thermometers, though rugged and sturdy, are nevertheless precision instruments.

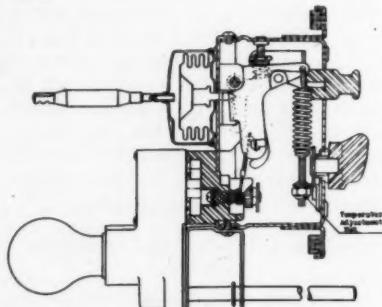


FIG. 6. COLD CONTROL

The control can be set either warmer or colder by changing the tension on the main adjusting spring (see Fig. 6). By turning this screw left (counter clockwise) the spring tension is relieved and both the starting and stopping temperature of the control is set colder. By turning the adjusting nut to the right (clockwise) the tension is increased on the adjusting spring, and both the starting and stopping temperature of the control is made warmer.

#### Changing Cylinder Head Assembly

1. Close the suction shut-off valves and operate the unit from one to three minutes.
2. Shut off the unit.
3. Close the discharge shut-off valve.
4. Wait five or ten minutes for pressure in the crank case to equalize.

5. Remove cap screws holding the cylinder head, and if replacing with a new assembly, make certain the gasket is in good condition. Make sure the new assembly is installed with ports in the same position as old head. Always dip the new gasket in oil before placing on compressor.
6. Loosen cap screw holding the discharge suction valve to compressor.
7. After making certain that the compressor has the proper amount of oil in crank case (adding any which might be lost), start the motor and allow to operate from one to two minutes. Then shut off the motor and open shut-off valves slightly. This will allow gas to come through the motor and compressor, purging any remaining air from the assembly. As soon as  $\text{SO}_2$  is detected coming from the discharge shut-off valve connection to the compressor, tighten cap screws and then open both the discharge and suction shut-off valves and unit should be ready to operate.

#### Procedure for Changing a Hermetic or Semi-Hermetic Compressor

1. Close the suction shut-off valve and allow the unit to operate from one to three minutes.
2. Shut off the unit.
3. Close the discharge shut-off valve.
4. Wait for five or ten minutes to allow the pressure in crank case to equalize.
5. The entire compressor can then be removed from the cabinet by taking off the two cap screws on both the suction and discharge valve fitting, and removing the

electric leads from the motor terminals. The assembly is then free to be taken from the cabinet.

6. Remove the oil plug on the compressor casting and drain all oil. Allow to drain for several minutes.
7. Measure the oil carefully and add one ounce more new oil to new compressor than was drained from defective one. If less than six ounces of oil is drained from the compressor, it is an indication of under-charge of  $\text{SO}_2$ , and the charge should be checked.
8. The replacement motor compressor should be put in position on the four mounting springs.
9. Connect the two shut-off valve fittings to their respective ports. If the old gasket has been torn or scratched, it should be replaced. Otherwise, it will be satisfactory to use the old one.
10. Connect the motor terminals. Check correct wiring diagram.
11. Loosen cap screws holding discharge valve to compressor.
12. Start the compressor and run for several minutes to expel air.
13. Stop unit.
14. Open suction shut-off valve slightly until odor of  $\text{SO}_2$  is detected from the discharge valve connection.
15. Tighten cap screws on discharge valve connection.
16. Open both shut-off valves until they back seat. Replace protecting caps and check for any possible leaks. The compressor is now ready for operation. Allow to operate for several cycles and check charge. Then purge slightly from connection on top of float valve to remove any possible air from the system and check the charge.

If it is impossible at times to get a machine to operate, although the cord may be plugged in to a live circuit, it is probable that the trouble is a faulty capacitor. Check the terminals to the capacitor and also check the capacitor by installing a new capacitor. If the motor then starts, the capacitor is at fault. To replace the capacitor, it will be necessary to remove the exhaust air channel. The capacitor is located at the back of the frame. Make certain all wire connections

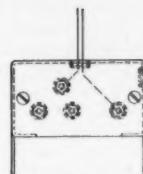


FIG. 7. CAPACITOR WIRING DIAGRAM

are in place and tight. Check wiring diagram in Fig. 7.

#### Thermostatic Bulb Discharged

If the control bulb has become discharged due to any cause whatsoever, it will be easy to determine if the bulb or the control is at fault. Remove the connections from the back of the control and connect to a new one. If the unit starts and operates, it is proof the control is at fault.

#### To Change Control

Before replacing a control, the capacitor, relay and all items mentioned above should be checked. Also, the overload heater element on the semi-hermetic units. Make certain the element is tight, and also make sure the proper element is used according to the voltage and cycle.

In order to change the control after the ice tray selector has been removed on the models equipped with the Freez'r Shelf, the clamp holding the control bulb is readily accessible. It is located near the left front of the Freez'r Shelf. On the models equipped with the conventional type of evaporator, the control bulb is clamped near the top on the right side of the evaporator. To remove the control, the clamp should be loosened and the bulb removed from the clamp. Then, by removing the control from the bracket to which it is attached, the entire control can be removed from the cabinet. Care should be exercised at this point in order to protect the capillary tubing on the control.

#### Other Repairs Possible in the Field

##### Overcharged.

If the suction tube frosts over outside of the cabinet, it indicates an overcharge. This is, of course, after the unit has been in operation and has cycled several times. In or-

der to correct this condition, it is necessary to purge a small amount of gas from the system. This is done by attaching a charging valve to the connection on top of the float.

Purge a small amount of gas and then allow the unit to operate for several cycles. Check the frost line on the suction tube. The correct charge is indicated when the suction tube (from evaporator to compressor) gets cold but does not frost over or drip water. Care should be taken when purging to properly dispose of the gas. Do not purge sulphur into the home. It can be purged into running water or lye water or through a tube or hose out a window or door, if care is taken to keep SO<sub>2</sub> from coming in contact with flowers, grass on the lawn, etc. It will be found more satisfactory to purge a small amount of gas several times in order to correct the charge rather than to purge a large amount at once. Do not overpurge the unit as this would cause an undercharged condition.

#### *Unit Undercharged.*

An undercharged condition of the unit is indicated by the suction boiler (boiler to which the suction tube is connected) of the evaporator not frosting properly. An undercharged condition can be corrected by adding a small amount of SO<sub>2</sub> liquid (never try to add SO<sub>2</sub> gas to the top of the float for only liquid will pass through the float) by the use of the charging valve. This SO<sub>2</sub> should always be added to the connection on top of the float valve. Care should be taken in adding SO<sub>2</sub> in order to eliminate any air or moisture entering the system.

Do not confuse adding SO<sub>2</sub> to the system with charging a unit that is completely discharged. When recharging a unit, the amount of SO<sub>2</sub> required is known, but when adding SO<sub>2</sub>, there is no way of determining the amount lost.

Attach charging valve to top of float. Connect one end of a convenient length of  $\frac{1}{4}$ " copper tubing to the fitting on the charging valve and the other end to SO<sub>2</sub> tank. Loosen flare nut on charging valve and crack valve on SO<sub>2</sub> tank to purge air from tube. When the odor of SO<sub>2</sub> is detected, tighten

flare nut. It is also well to warm tube to drive out moisture before flare nut is tightened. Check for SO<sub>2</sub> leaks at tube connections.

Open valve on float by turning counter clockwise and allow several ounces of liquid SO<sub>2</sub> to enter system. It may be necessary to warm SO<sub>2</sub> container slightly to force it into the system. To remove SO<sub>2</sub> tank, close valve on tank and heat copper tube to vaporize liquid and drive it into the system. Close valve on unit and remove the tube. Allow the unit to operate for several cycles; then purge slightly to remove any air from the system and to correct the charge. *The correct charge is determined by all the boilers on the evaporators frosting properly. The suction tube should get cold but not frost outside of the cabinet.*

#### *Float Valve Stuck Closed.*

If the float valve is stuck closed, the entire charge of SO<sub>2</sub> will be pumped into the high side of the system. The evaporator will gradually warm up and if the float valve is completely plugged or stuck closed, no refrigeration will be obtained. In the event air has gotten into the system, it may affect the operation of the float valve. Before condemning a float, purge any possible air trapped through the connection on top of the float. This will relieve the air pressure and the float may work satisfactorily. If a float is operated normally, it will be somewhat warmer than room temperature. If a float is stuck closed, or there is air in the system, the float will feel cold to the hand.

#### *Float Valve Stuck Open.*

If the float valve is stuck open, it will not have a great effect upon the operation of the refrigerator other than to shorten the cycle and increase the running time. This condition can usually be remedied by tapping the float lightly with a hammer. If the float is found to be stuck or not operating properly, it can be replaced as follows: Always have the new float at hand and ready to install before attempting to remove the old one. Never leave the system open to the air for any length of time.

#### *Changing Float Valve.*

To change the float, it is necessary to

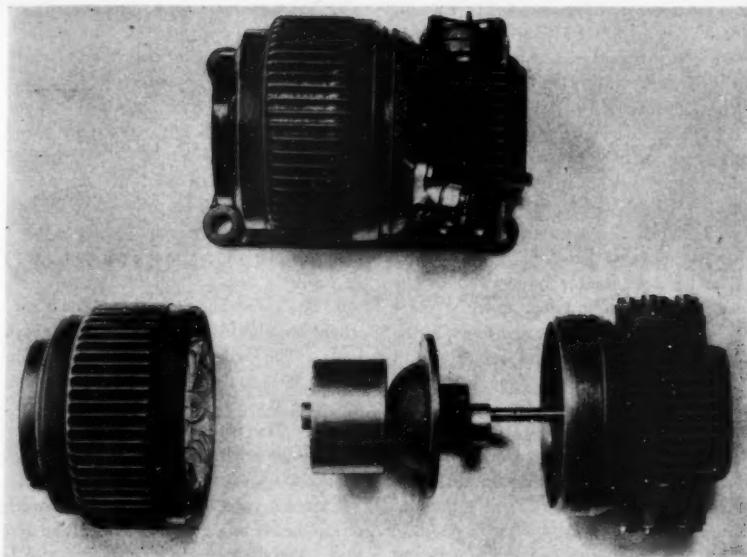


FIG. 8. GIBSON HERMETIC MOTOR COMPRESSOR ASSEMBLY PARTS

pump the entire charge into the high side of the system. Close shut-off valve on the side of the receiver tank and run until the evaporator is warm. The evaporator can be warmed slightly to speed this up. Then, close the suction shut-off valve on the compressor. The capillary tubing below the float valve is connected by a flare connector. After the sponge rubber tubing has been removed, the flare nut may be removed from this connector, thus disconnecting the float at this point. The line connecting the top of the float to the receiver tank may be removed by removing the flare nut at the receiver tank shut-off valve. The new float should be warmed thoroughly to dehydrate before it is installed. Place the new float in position and attach the flare nuts both on the capillary tubing below the float and at the receiver tank.

Make certain the proper amount of oil is in the crank case; add same amount of new oil which might have been lost. The discharge valve on the compressor should now be closed. Then loosen the cap screws which hold the discharge valve to the compressor

and start the motor for one or two minutes to allow the compressor to pump the air out of the evaporator and float assembly. These can be warmed slightly with a torch while the motor is in operation. Then, shut off the motor and open the liquid shut-off valve at the receiver tank, allowing SO<sub>2</sub> to pass through the float and the evaporator. As soon as SO<sub>2</sub> is detected coming from the discharge shut-off valve connection on the compressor, tighten the cap screws on the discharge valve connection and open the discharge valve. Then completely open and back seat the liquid shut-off valve on the receiver tank. This should eliminate any remaining air from the system. However, it is still possible to purge the system from the top of the float, in the event the machine does not operate satisfactorily.

Air in the system can usually be detected by high head pressure, noise and high wattage, which might cause the motor to heat.

#### General Service Instructions

The design of the Gibson electric refrigerator is to give the advantage of the her-

metically sealed machine, yet being easy to service in the field. It is claimed that it is no more difficult to service these machines in the field than the conventional belt drive. The following information on the hermetic unit is not given as sufficient instructions to make internal repairs, but simply to serve as a reminder or reference for the individual who is familiar with the replacing of these parts.

Fig. 8 shows the hermetic motor compressor assembly parts.

1. The hermetic motor is screwed to the compressor, and can be taken apart by placing the assembly compressor end down in the block head to fit it. The compressor should seat down into this block far enough in order that the cylinder block takes part of the strain.

2. A large wrench, approximately 5 ft. handle, can be made by using an old automobile break band which will grasp the motor housing.

3. This is a regular thread and in order to disassemble, the motor should be turned to the left or counter clockwise.

4. After this has been taken off, the stator (which is pressed into the motor housing) can be removed. The stator winding cannot be removed from the housing until a suitable screw type puller is available.

5. The rotor, oil separator and eccentric or crank can be removed by taking out the three screws which hold the oil separator plate to the compressor housing. The cylinder heads can be removed and thus the piston, wrist pins, connecting rod, etc., can be replaced easily.

6. The following figures are given for use where the shop is equipped with gauges and tools. The piston is fitted to the cylinder within .0005 to .0008 inches. The piston stick-out over the end of the block is .004 to .007 inches. The connecting rod and wrist pin can be selective fit, in order that they are not binding.

Extreme care is necessary when working on the inside of this assembly. Make certain that all parts are carefully washed and dried in order that air and moisture will not cause corrosion. All parts changed should be care-

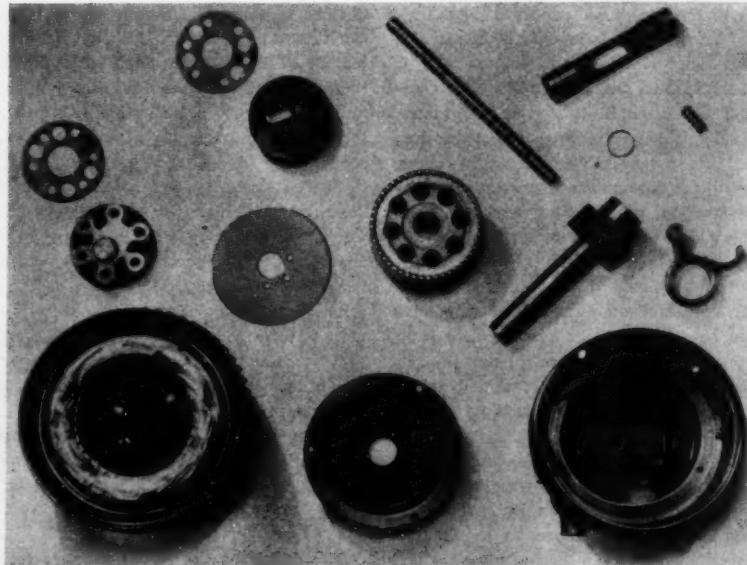


FIG. 9. GIBSON HERMETIC COMPRESSOR ASSEMBLY PARTS

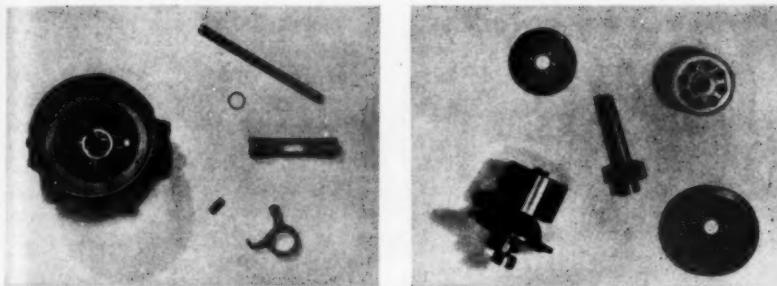


FIG. 10. HERMETIC COMPRESSOR PARTS AND HERMETIC MOTOR PARTS

fully oiled with new oil and, after any repairs have been made, the assembly should be dehydrated or dried in an oven for several hours; then both suction and discharge ports should be sealed.

A new rubber gasket, which is used to seal between the motor and compressor, should always be used when assembling. Make certain the old gasket is carefully and entirely removed and the surfaces are clean.

#### Instructions on Semi-Hermetic Units

The semi-hermetic unit employs the same type and design compressor. In fact, the

internal parts are interchangeable. The unit has the same capacity as the hermetically sealed unit. The compressor is directly connected and driven by the main motor shaft, thus eliminating belts, pulleys, etc. The shaft seal is of Gibson design.

The factory recommends that the various assemblies on the refrigerator be replaced in the field rather than trying to make internal repairs in the field. For example, motor compressor assemblies, float assemblies, relay assemblies, control assemblies and various other small parts can all be replaced very easily.

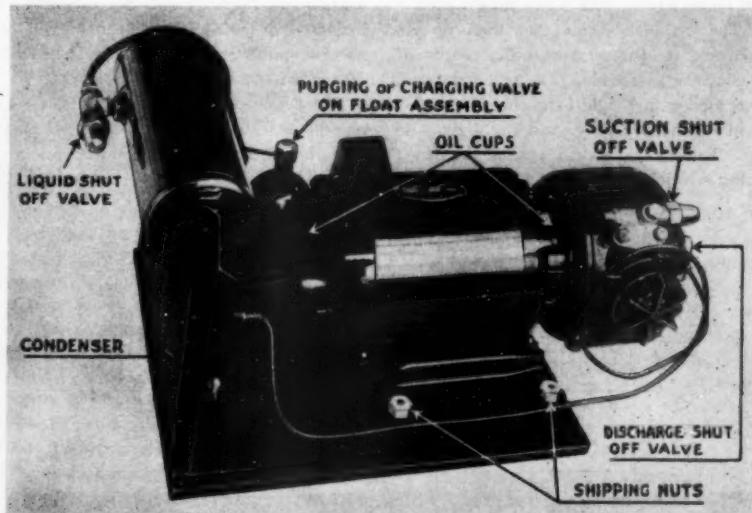


FIG. 11. COMPLETE SEMI-HERMETIC UNIT ASSEMBLY

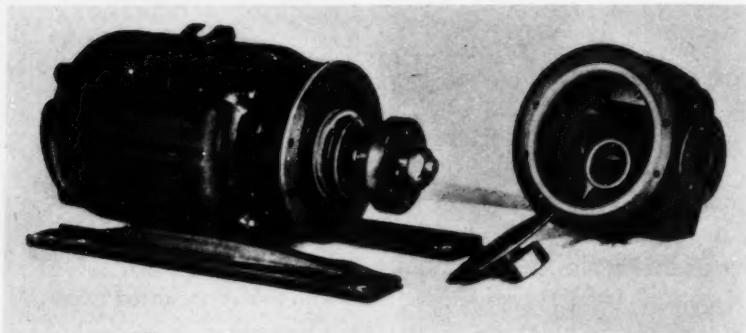


FIG. 12. SEMI-HERMETIC COMPRESSOR PARTS

After the assembly has been replaced, it can then be taken to the shop, and if proper equipment is available, these can be made in the shop. However, before an assembly is taken apart in the field, the service man should be fully acquainted with the construction and replacing of parts.

1. On the semi-hermetic unit, the compressor can be removed from the motor by removing the eight cap screws which hold the compressor to the motor end bell. Then force the compressor off by tapping the cylinder heads lightly with a raw hide mallet.

2. The cylinder heads can then be removed and the piston, connecting rod, wrist pin, etc., are accessible. The eccentric rank is threaded with a right hand thread and this should be taken off by tapping lightly to start. This eccentric rides against the thrust bearing which, in turn, fits against the seal

plate which is held in place by the six cap screws. After these have been removed, the seal assembly can be taken out and replaced should it be at fault.

3. It is also important when making internal repairs that all parts are carefully washed clean before any repairs are started. See that they are kept carefully oiled with new oil during the assembling process. New gaskets should always be used in regard to assembling the seal and in the cylinder heads. After the motor and compressor have been assembled, they should be carefully dehydrated or dried in an oven. Then both suction and discharge ports should be sealed. *Motor and Electrical Connections.*

The repulsion induction motors, as used on odd cycles and frequencies, do not require an automatic relay due to difference in design. A separate terminal block (Fig. 13),

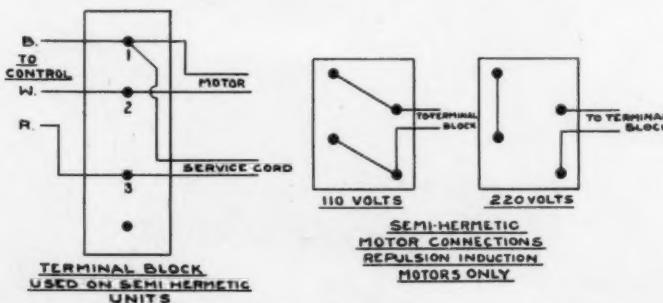


FIG. 13. MOTOR CONNECTIONS ON SEMI-HERMETIC UNITS

fastened to the back of the cabinet under the tube channel, is used to make all electrical connections.

The repulsion induction semi-hermetic motors can be changed from 110 volt to 220 volt or vice versa, or 125 volt to 250 volt or vice versa, etc., by simply changing the motor terminal connections. The above is not possible on capacitor starting induction run motors.

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### SERVICE GUARANTEES?

*EDITOR,  
REFRIGERATION SERVICE ENGINEER:*

The refrigerator guarantee racket is off to a fresh start now that one manufacturer is offering ten year protection. Nearly every manufacturer of domestic refrigeration is offering one year guarantee with a four year replacement contract. Along comes one manufacturer with five additional years and the other makers won't let him get away with it for long. Unless something is done we will see ten year guarantees in vogue. With all manufacturers offering the same guarantee of five years, no one has an advantage except the public. They, of course, get a free ride. But, and here is the point, no more refrigerators are sold, the industry gains nothing, but suffers a lot.

What a situation for a so-called well organized giant industry to be in! How the automobile makers must shake with silent mirth, with their universally accepted ninety-day guarantee, when they see the refrigeration industry stretching out to five long years of protection. Try and get a free fan belt on your car four months after you bought it—yet the generous gents in refrigeration will give you a new belt free even if you put in your claim in 1941.

Yet with all this generous protection, we have a dangerous boomerang in the "protection contract." Mr. John Public thinks he is getting a complete guarantee; did not the salesman who sold him the refrigerator tell him so?—and of course you can't expect him to pick out the jokers in the protection contract himself.

So in blissful ignorance of what he really is entitled to, some day maybe two years hence, Mr. John Public will holler for service

and be told what? "Oh, we don't guarantee thermostats"—or "The light switch is not covered by our protection contract"—or "You will have to pay a labor charge to repair the compressor although you'll get the parts for nothing providing the factory decides they were not subject to abuse." There in a nut shell is the makings of a first class boomerang, that can sail back to us in 1938 and while not actually being a major catastrophe, said boomerang can crack some insulated skulls and blacken a few magic eyes belonging to the dealers, distributors and manufacturers.

Why doesn't the *REFRIGERATION SERVICE ENGINEER*, as the service industry's leading publication, undertake to open its columns to the views of big and small dealers, distributors, and factories? With the object in view of getting the consensus on the following important questions:

1. Where and when will the race for longer and bigger guarantees end?

2. Who will be the long-pull goat—the manufacturer, distributor, or the dealer?

3. Will there be more domestic refrigerators sold in 1936 now that the customer gets protection for five years than would be sold if all makers had a one year guarantee?

4. Cannot manufacturers get together and agree on a standard guarantee—and how long should it be for?

There is a fine set of questions to shoot at. Let some of the industry big shots tell us what's what and why. I'll stake my reputation on the fact that thousands of dealers and hundreds of jobbers would like to know the answers.

Let Refrigeration Service Engineers be the true leader by publishing the views of the trade of this vital subject.

Yours very truly,

The Harry Alter Company,  
By Harry Alter, President.

\*\*\*

John E. Herson,  
New Jersey.

I am a constant reader and subscriber of your publication, *REFRIGERATION SERVICE ENGINEER*. I like this book very much and want to compliment you on the valuable information found in same.

?????????????????????

THE

# Question Box

Readers are invited to send their problems pertaining to the servicing of household refrigerators and small commercial refrigerating equipment as well as oil burners to "The Question Box," which will be answered by competent authorities.

?????????????????????

THE following questions submitted to this department are answered by Mr. George H. Clark, chairman National Educational and Examining Board, Refrigeration Service Engineers Society.

Have any readers other opinions regarding the problems involved. Send them to the Editor.

## What Size Compressor

QUESTION 119. I am interested in the way to determine what size compressor will be necessary to cool a box of a certain size—say 5'x8'x10'. There are one or two places locally who require refrigeration (walk-in coolers mostly) so before I can tell them what the cost will be I have to know how to figure the amount of coil necessary and what size compressor will be required. By size of compressor, I mean  $\frac{1}{4}$ ,  $\frac{1}{3}$ ,  $\frac{1}{2}$  or  $\frac{3}{4}$  ton. Use your own example and then I can work from it.

ANSWER: In answering this question, I am sending a copy of a bulletin which deals in heat leakage, service load and coil sizes in connection with coolers of any size.

The compressor necessary to take care of these jobs of course may be figured in tonnage of refrigeration by figuring that 12,000 B.t.u.'s per hour is one ton of refrigeration per 24 hours. It should be borne in mind, however, that the compressor under normal conditions should not be expected to run more than one-half or one-third of the time and that the compressor size should thereby be two or three times the size that might be calculated from figuring the heat leakage or service load on the refrigerator.

## Double Refrigerant Cooler

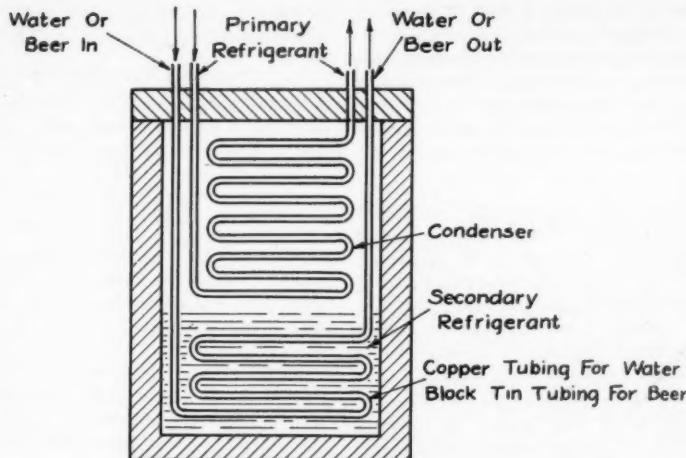
QUESTION 120. Can you give me further details regarding the construction of a double refrigerant type cooler, as described on page 632 of the Fourth Edition of Household Refrigeration?

I am particularly anxious to ascertain details such as the amount of insulation to use in such a system, which I expect to use for cooling beer, and the method of charging, and any other construction details you might be able to furnish.

ANSWER: The double refrigerant type cooler as described in *Household Refrigeration* consists of a shell partly filled with refrigerant and a water coil or beverage coil which passes through the liquid refrigerant. The primary refrigerant coil is located above the surface of the liquid refrigerant in the shell. As far as the secondary refrigerant is concerned, this system amounts to the same thing as a steam heating system. Thus the liquid refrigerant is evaporated by the warm beverage passing through the beverage coil and it is condensed in the upper part of the system on the primary refrigerant coil.

The Temprite liquid cooler works on a similar principle except that the refrigerant passes directly into the shell through a low pressure float valve. Beverage coil is located in the liquid refrigerant, the expanding refrigerant being regulated with respect to evaporating pressure by means of their temperating valve which limits the low point to which the pressure in the shell can go. The temperating type of liquid cooler has a very rapid heat transfer from the beverage coil to the liquid refrigerant. Evaporation is very rapid and very close regulation of the beverage is obtained.

One advantage in the double type refrigerant cooler that I can think of is that the secondary refrigerant may be a low pressure refrigerant and thereby not require such a heavy shell as would be required when using direct expansion of methyl chloride or  $\text{SO}_2$ . That is, the secondary refrigerant could be ethyl chloride which would have a slight vacuum at the pressure which would prevail in the shell, or Carrene, which would have a considerably higher vacuum; and possibly butane (not Isobutane) might be



DETAILS OF CONSTRUCTION OF DOUBLE REFRIGERANT COOLER

used as a secondary refrigerant, in which case the pressure in the shell would operate at slightly above atmospheric pressure.

The general construction of such a cooler would involve the use of a shell of some type which may have a head secured to it by means of a flange and gasket so as to be refrigerant tight with the two coils located in the head.

The insulation requirements for such a cooler are not great as the shell of the cooler will operate at beverage temperature which should be in the neighborhood of 40°, and insulation is used only to prevent the slight loss of refrigeration and the sweating which might occur on the outside of the shell. One inch of almost any good insulating material would take care of the cooler very nicely and it is largely a matter of appearance as to what type of insulating material should be used.

With respect to charging the system, the shell should be evacuated and then charged with the secondary refrigerant and only sufficient refrigerant should be used to nicely cover the beverage coil. It may be possible that it would be easier to pour the low pressure or secondary refrigerant in through an opening in the head of the shell and then purge at this connection in order to eliminate the air from the system; or if

Carrene were to be used it would be necessary to draw a vacuum in the shell after the Carrene was put in, in order to remove any air. Only a partial vacuum should be drawn, of course, to insure the removal of all air in the system, which should not require the purging or drawing off of more than a few ounces of the secondary refrigerant.

The primary refrigerant should use some sort of valve in the suction line such as is used in the Temprite Cooler—that is the suction line pressure reducing valve—which will maintain the pressure in the primary refrigerant coil at such a point as to insure an evaporation temperature between 34 and 40° F. A thermostatic expansion valve might be used on the inlet to the primary refrigerant coil.

This type of cooler should be more effective than the usual heat exchanger type which passes heat from the beverage to be cooled to water or brine and then to the refrigerant coil; but it will not be any more effective or as effective as the direct expansion cooler with the beverage coil located in the liquid refrigerant.

#### Copeland Compressor

QUESTION 121. *A few questions in regard to a Copeland refrigerator:*

*This machine has been changed to SO<sub>2</sub> from*

*Isobutane. Compressor has 2" bore, 2" stroke, 325 speed, former speed of 445 r.p.m.*

*What size opening has the capillary tube to it? Also, what size fixed orifice would be required for a box of this size?*

*Would a capillary tube or fixed opening work as well as an expansion valve on this job?*

**ANSWER:** In changing the refrigerant from Isobutane to sulphur dioxide a certain reduction in speed is advisable. However, I would suggest that the compressor's speed be reduced to not more than 375 r.p.m.

The capillary tubes may vary somewhat with regard to the size of opening, but a common size is one which uses a  $\frac{1}{16}$ -inch bore. The fixed orifice which would give the same restriction as 12 to 30 inches of the capillary tube would be so small in itself that I should say it was inadvisable to depend on such means to reduce the pressure on the refrigerant.

This fixed orifice method may be used by having a series of plates, each of them having a small opening and the openings offset so as to cause a change in direction in the refrigerant. A capillary tube or fixed opening should work all right except that the quantity of refrigerant in the system will be extremely small. In all probability you would find the total refrigerant charge would be in the neighborhood of three to four ounces and, of course, a small loss in refrigerant amounting to an ounce or so would have a tendency to cause poor refrigeration. It is also important to be sure that the liquid outlet from the receiver is at the extreme bottom of the receiver or it might be possible that the receiver might be eliminated entirely and that a screen connection be placed at the outlet from the condenser and a capillary tube extended from the screen to the evaporator.

The capillary tube operates, of course, to give a high suction pressure while the evaporator is warm and the suction pressure is gradually reduced as the evaporator cools down. Such a system can be worked with either a temperature control or a pressure control. If it is to be used with a temperature control the temperature control should not be clamped to the suction line, but instead it should be clamped to the

evaporator, or it should be in the evaporator itself.

#### **Frigidaire Water Regulator**

**QUESTION 122.** *The writer has been asked to service a Frigidaire automatic condensing water regulator with two weights, metallic bellows, etc., and would appreciate any information you can give me on this. The installation was made eight years ago.*

**ANSWER:** The Frigidaire pressure control and water regulator which the correspondent asks about embodies a low pressure control with a high pressure cut-out and a water valve.

There are two weights on the low pressure part of this apparatus, the larger one being used to adjust the pressures which prevail in the suction side of the system at the on and off points while the smaller one is an adjustment for cut-in pressure and does not affect the cut-out pressure.

In one model of control which was used a good many years ago the only adjustments that were made were by means of these weights. A later model includes a threaded stem which comes through the top plate of the control and which has a nut on it which is turned to the right for a lower pressure at both cut-in and cut-out points and which is turned to the left to raise cut-in and cut-out pressures, the small weight being used to change the cut-in point without affecting the cut-out. The proper procedure to follow in adjusting this control is to obtain the proper cut-out point by adjusting the nut or the position of the large weight; then the cut-in may be increased to the proper point by sliding the small weight out on the rod on which it is mounted. It will be noticed that the small weight lifts before the control switch closes but that it drops down to stop before the control switch opens.

A third weight acts as a water valve regulator and the water valve tends to let less water through and thereby maintains a higher condensing pressure when the weight is farthest out on the rod. A screw adjustment on the end of the stem which operates the water valve can be used to insure that the water closes off when the machine cuts down and the head pressure is reduced or it may be adjusted to so that a small con-

tinuous flow is obtained through the condenser so as to eliminate possibility of water coil freeze-up in cold weather. If the pressure continues to increase after the water valve is opened the weight will continue to raise until a lever opens the control switch thereby protecting the system against excessive pressure due to water failure or other causes.

#### External Equalizer

**QUESTION 123.** *Will you please tell me what the external equalizer does, and how it does it, and why it is necessary to use it with thermo expansion valves? This is referred to in the February issue of the REFRIGERATION SERVICE ENGINEER.*

*Also please advise what a fairly good wet-bulb thermometer will cost.*

**ANSWER:** The external equalizer in connection with the thermostatic expansion valve is required for use with coils which cause a high drop in pressure through the coil.

The factory setting on a number of valves may be such that the temperature of the bulb remains ten degrees higher than the temperature of the evaporating refrigerant leaving the expansion valve through the whole range of operation of the valve. We say that a valve so adjusted is set for ten degrees super-heat. That is, the temperature of the refrigerant in the tube where the thermostatic bulb is clamped on will be in the neighborhood of ten degrees above evaporation temperature. Actually the bulb temperature will not equal the refrigerant temperature in the tube and probably the actual temperature of the refrigerant may be only five degrees above evaporation temperature.

However, with this setting the valve is adjusted so that with the bulb of a methyl valve at 32 degrees the refrigerant will leave the valve at about 15 pounds gage pressure and with methyl chloride this will give 22 degrees evaporation. However, due to the design of the coil, the drop in pressure through the coil is ten pounds per square inch. In this case, if the thermostatic bulb is at a temperature of 32 degrees, the valve would be so adjusted as to feed refrigerant into the coil at a pressure of 15 pounds gage or a temperature of 22 degrees. How-

ever, due to the ten pound drop in pressure through the coil, the pressure at the outlet of the coil would be five pounds per square inch gage and this would correspond to an evaporation temperature in the neighborhood of three degrees so that the difference between the bulb temperature and the temperature which corresponded to the coil outlet pressure would not be ten degrees but rather 29 degrees. As a result, the valve will starve the coil.

To remedy this the valve is so designed that the pressure of the evaporator at the outlet of the coil balances the pressure in the power element to regulate the opening and closing of the valve needle instead of it having the pressure in the outlet of the valve balance the pressure in the power element to regulate the valve opening. In this case, then, with the valve set for ten degrees super-heat, with the bulb at 32 degrees, the pressure leaving the coil would be 15 pounds gage and, if we had refrigerant evaporating at this pressure, its evaporating temperature would be 22 degrees.

The refrigerant will be entering the coil, however, at a 25 pound gage pressure which will correspond to an evaporation temperature of about 36 degrees or 14 degrees above the actual bulb temperature. This will make the whole coil refrigerate, but, of course, the temperature in the inlet part of the coil will be higher than the temperature in the outlet part of the coil.

A wet-bulb thermometer is no different than a dry-bulb thermometer except that the bulb has a wick fastened over it which extends into a container of water. A temporary wet-bulb thermometer may be made up by loosely tying a piece of cloth over the thermometer bulb and saturating it with water and I should advise letting it set for five minutes before making a reading to insure that the thermometer has reached the temperature at which it will stop.

A combination of two thermometers, one having a wet-bulb and one having a dry-bulb can be obtained for approximately \$3.50.

One method of checking the wet-bulb thermometer to see that it is right is to let the wick thoroughly dry out and under this condition the wet and dry bulb temperatures should be the same.

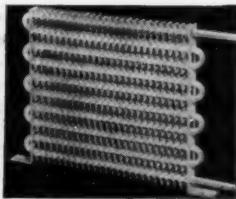
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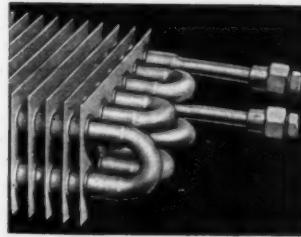
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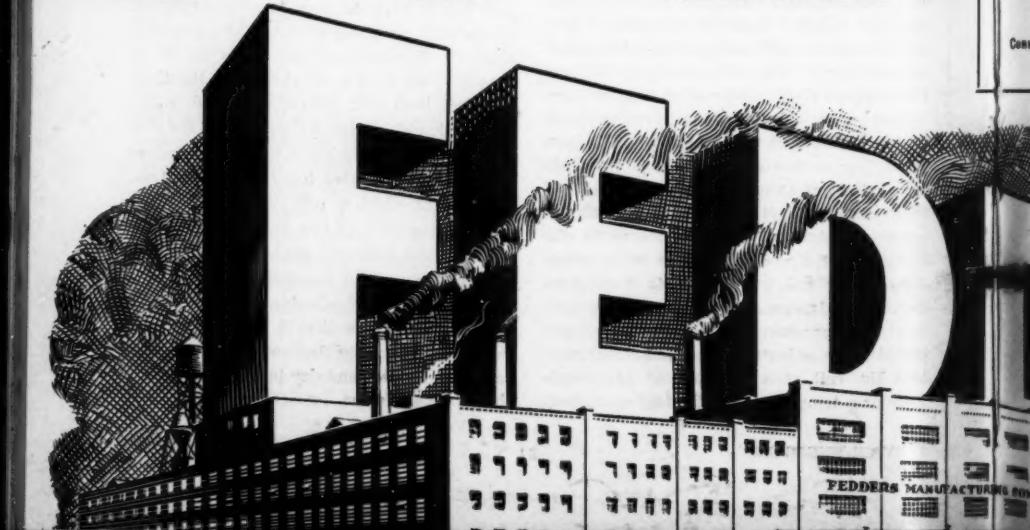
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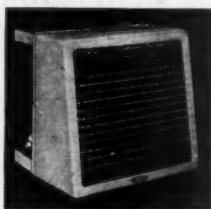


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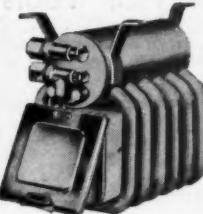
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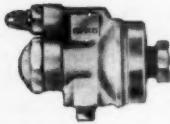
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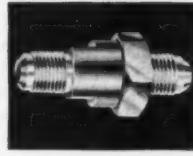
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Evaporators



Automatic  
Expansion Valve



Float and Header  
Assemblies



Check  
Valve



Constant Pressure  
Valve



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Thermostatic  
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## NEW MECHANICAL DEVICES Service Tools and Special Equipment

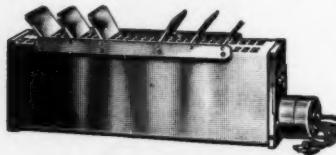
Under this heading there will be published illustrated descriptions of new or improved service tools and equipment for the Service Engineer. Information contained in this department is furnished by the manufacturer of the article described and is not to be construed as the opinion of the Editor.

### AIR FILTER AND CIRCULATOR FOR COMMERCIAL APPLICATIONS

A SIMPLE, inexpensive air filtering and circulating device has recently been introduced by the Betz Corp., Hammond, Indiana, under the trade name of "Filterpure."

Filterpure is a novel device for installation in refrigerated cases and cabinets. It is a self-contained unit  $8\frac{1}{2} \times 6 \times 20$  inches, weighing 6 lbs., and installed in a few minutes' time, without any changes in the coil arrangement. It contains a small motor using only 25 watts, and continually forces all air in the refrigerated case through activated carbon pads, thus purifying the air as it forces circulation.

Filterpure is the result of three years of



FILTERPURE AIR PURIFIER

study, research and development by refrigeration technicians in collaboration with one of the world's largest industrial organizations. It has an air delivery of 35 cubic feet per minute, and this circulation can be decreased to 9 cubic feet, or any intermediate quantity between these two figures as desired.

Circulation is one of the real problems in commercial refrigeration, and the user invariably arranges his foodstuffs so that either the warm or cold air duct, or both, may be restricted. This causes air pockets, and portions of the refrigerator may be warmer or drier than other parts of the case. It is due to these pockets that a large per-

centage of loss is experienced from food spoilage. It is a well-known fact that in refrigerated cases and cabinets there is a constant emanation of gases from foodstuffs, and these gases are carried from one food and absorbed by others. These gases consist of carbon monoxide, carbon dioxide, acetates, alcohols, etc.

With the Filterpure, it is claimed that the gentle continuous flow of filtering cold air into every nook and corner, protecting all the food in every part of the refrigerator at all times, you eliminate this condition. It is further claimed that the Filterpure will maintain the color and firmness of meats, and lower the temperature four to twelve degrees. It is possible to refrigerate foods that will ordinarily absorb odors very easily, such as sauerkraut, bulk cheese, fish, etc. Its circulation also stops sweating of cases.

Complete information and recommended methods of installation may be secured from the Betz Corp. at Hammond, Indiana.

\*\*\*

### DOLE REFRIGERATING COMPANY IN NEW LOCATION

IMPELLED by the need for more room to step up production to the level of orders, Dole Refrigerating Company have leased two floors at 208 N. Clinton Street, Chicago, where they will have approximately 24,000 square feet of modern office and plant space for the manufacture of DoleCold Patented Vacuum Cold Plates.

With offices conveniently and attractively arranged on the first floor, this progressive firm under the management of Mr. Edwin J. Tweed, has launched a program of plant modernization and expansion which will better enable them to fill the huge volume of orders received since the introduction of their new line of DoleCold Evaporators.

New equipment, valued at over \$25,000, and including the latest in hand and power breaks, power sheers and presses, coil benders, riveting machines, spot welders and pressure test tables, has been delivered and is being installed as rapidly as possible without interfering with normal production schedules.

A 150 KVA power seam welder, capable of ten times the production of arc or gas welders, will greatly speed up the welding of DoleCo plates.

A special room is being built, heavily lined with sheet iron and equipped with exhaust fan, in which the finished plates will be blasted with steel grit and then sprayed with molten metal to give them an attractive and absolutely non-corrosive finish. This equipment is the very latest and seldom found in other plants in this country.

Another process, usual in refrigeration manufacture, is dehydration. In a special room the plates are treated before evacuation with high temperatures and other equipment necessary to dry out all moisture within the coils. This room is heavily insulated and forms a perfect structure for this purpose.

Plant installation is expected to be completed in thirty days whereupon the Dole Company will be able to make prompt shipment of all orders. The company is serving four distinct fields with a comprehensive line of Patented Vacuum Cold Plates: a replacement Evaporator line for domestic refrigerators; truck plates for the cooling of refrigerated truck bodies; a conversion unit for ice cream cabinets; and cold plates for commercial coolers, cabinets and counters.

The distributor organization, practically completed, assures prompt shipment of Dole-Cold Plates from stocks maintained in all principal cities in the United States.

\*\*\*

#### NEW GASKET DISPLAYER

THE Jarrow Products Corp., Chicago, manufacturers of all rubber and rubberized fabric door gaskets, has just produced an attractive counter display showing their stock numbers of the door seals which they carry. The manufacturers will be very pleased to supply jobbers with this display stand upon request.

#### NEW BRONZE ROTARY SEAL SEAT

CONSTANT experimental and development work by the Rotary Seal Company with this one thought in mind—to give service engineers the most dependable and efficient replacement seal unit possible—now presents a new "Quick-Sealing Bronze Seal Seat."

To the many recognized advantages of the Rotary Seal Replacement Unit to overcome the service man's greatest problem—that of repairing leaky seals on refrigerator compressors—the Rotary Seal Company now announces a new bronze seal seat (patent applied for), which will eliminate the usual long "run-in" time. This added feature developed by the above mentioned manufacturer of seals for rotating shafts and now incorporated in all replacement seal units will be welcomed by those service companies eager to give their customers utmost satisfaction.



NEW ROTARY SEAL SEAT

The construction and operating principles of the Rotary Seal are universally known to service engineers, and so in passing let it suffice to merely mention some of its important advantages.

- (1) Eliminates refacing the shaft shoulder.
- (2) Cuts time of a seal repair job to a matter of minutes.
- (3) Makes possible the seal change on the job.
- (4) Provides a dependable and efficient seal.
- (5) Saves money for the customer and at the same time increases the service man's profits.

A magnified view of the new bronze seal seat is shown in the accompanying cut. It will be noticed that instead of furnishing a surface approximately  $\frac{1}{8}$ " wide finished perfectly smooth, this new seat has a series of small annular v-shaped grooves defining a plurality of annular ridges having apices forming relatively sharp edges. The numerous seats thus arranged in tandem each of relatively small area provide rapid initial wear. A perfect metal to metal joint between the bronze stationary surface and the hardened steel face of the seal ring which rotates with the shaft is thereby effected after a few revolutions of the shaft. Also, the small grooves, approximately .005" deep and .005" wide at the top, fill with oil and the oil thus entrapped forms an oil seal preventing leakage of the refrigerant until a perfect metal to metal joint has been formed. As the narrow seats are lapped down by their contact with the hardened steel of the seal ring surface their area naturally increases and so in time the entire width of the bronze seat is contacted by the seal ring and the same "long-life" qualities of the Rotary Seal are obtained.

It will readily be seen that a seal of this kind has many advantages especially on installations where there is, due to some irregularity of the shaft or the end plate, any departure from a perfect squareness of the stationary bronze seat with the axis of the shaft. Although this new and improved method of facing the bronze seal surface has only recently been used in production it has been thoroughly tested under the most severe and most unfavorable operating conditions. In all of the installations tested, the seal held perfectly as soon as the parts were in place, and absolutely no running-in was required.

A full line of Rotary Seal Replacement Units covering every popular make of domestic and semi-commercial refrigeration compressor is now offered by recognized jobbers of refrigerator replacement throughout the country. The Rotary Seal Co. has recently advised the trade that other seals have been offered as genuine "Rotary" seals. The Rotary seal is fully protected by Letters Patent of the U. S.

## CARL SCHNEIDER, ST. LOUIS, OPENS NEW STORE

**T**HE Carl Schneider Co., 2901 Missouri Ave., St. Louis, Mo., one of the leading air conditioning and refrigeration supply distributors in St. Louis and vicinity, has recently opened Store No. 2, at 4056 W. Pine Blvd. This new location is in the center of St. Louis, and will be convenient to the large majority of service men and service organizations in St. Louis and vicinity.

This store, as Mr. Carl Schneider stated, "is evidence of the growth of our organization, and we are appreciative of the cooperation of the servicing industry that has made possible the opening of this new store."

\*\*\*

## NEW DISTRIBUTORS FOR VIRGINIA SMELTING COMPANY

**T**WO new distributors in the western section of the United States have recently been appointed by the Virginia Smelting Co. of Boston, Mass., to expedite deliveries on their two well-known refrigerants—Esotoo (sulphur dioxide) and V-Meth-L (methyl chloride).

The California Refrigerator Co., 1077 Mission St., San Francisco, will act as distributor for V-Meth-L in northern California.

W. L. Coutts, Inc., 601 S. State St., Salt Lake City, Utah, is the new distributor for both sulphur dioxide and methyl chloride in the State of Utah.

\*\*\*

## RANCOSTAT SERVICE MANUAL

**R**ANCO, of Columbus, Ohio, has compiled a Service Manual for Rancostats to enable the refrigeration service engineer to make adjustments on the job rather than return the Rancostat, and in this manner avoid call-backs.

In publishing this manual, the company has discontinued sending with each replacement Rancostat a special instruction sheet, and in its place are substituting a small printed form which indicates the Rancostat warranty, giving also instructions relative to re-ordering Rancostats and auxiliary parts.

cured by addressing the Automatic Reclosing Circuit Breaker Company at 601 West Fifth Avenue, Columbus, Ohio, and this applies to requests from the United States and Canada. Requests from foreign countries should be addressed to the export agency of the company, Melchior, Armstrong, Dessau Company, 300 Fourth Avenue, New York City.

\*\*\*

### REFRIGERATION PARTS CATALOG FOR SOUTHWEST

THE Beckett Electric Co., Inc., Dallas, Texas, has recently issued their new refrigeration parts catalog. This company has established a wholesale jobbing house to supply the refrigeration field in the Southwest.

The Beckett Electric Co. will place a copy of this catalog in the hands of all refrigeration service men in the territory served by this company. The catalog contains 48 pages, illustrating a comprehensive line of equipment and replacement parts for refrigeration work.

\*\*\*

### DU PONT REDUCES PRICE OF METHYL CHLORIDE REFRIGERANT

THE du Pont Company has announced a reduction of 5c per lb. in the price of Artic, the du Pont special grade of methyl chloride, widely used refrigerant in household and commercial refrigeration units. The reduction is effective April 1, 1936.

Du Pont officials stated that the price reduction is in line with its policy to pass on to the trade economies effected in manufacture and by increased use of this refrigerant.

\*\*\*

### ODOR ABSORBER

THE Premier Chemical Laboratories, Inc., has just put on the market an improved air conditioner for both household and commercial refrigerators.

This conditioner is put up in an attractive package under the name of "Deodaire." The manufacturers claim that it will absorb and hold unwanted food odors and prevent one food odor from contaminating other foods.



It is also claimed that the natural food flavors are thereby preserved, and the refrigerator is kept sweet and pure, while ice cube water, by its use, is kept untainted.

Complete information can be obtained by writing the manufacturers direct.

\*\*\*

### AIRO SUPPLY CO. ISSUES 96-PAGE PARTS CATALOG

THE Spring Catalog of Airo Supply Co., wholesale distributors of parts, tools, supplies and accessories for refrigeration and air conditioning has just been released to the trade. Designated as Catalog No. 6A, it is 5 1/2" x 8" in size and consists of 96 pages. All merchandise is illustrated and prices shown are net prices to the trade.

In addition to more complete sizes and types of the supplies previously carried, the company has made many additions to its line, including compressor replacement parts for most popular makes, complete line of brass pipe fittings, packless line shut-off valves, dehydrators and strainers in all sizes and capacities, ice cube and defrosting trays, electric motors, cabinet hardware, shop and service tools, steel pulleys, capacitor condensers, etc.

\*\*\*

### NEW FEDDERS JOBBERS

MARC A. SHANTZ, manager of the Chicago office of the Fedders Mfg. Co., has recently announced the appointment of the Forslund Pump and Machinery Company, Kansas City, Mo., as distributor for their products in that territory. A complete stock of Fedders products will be carried for prompt delivery and will be featured in

their new catalog, which will be issued shortly.

In Davenport, Ia., the Republic Electric Co. will act as jobber, stocking a complete line of Fedders products.

In the metropolitan Chicago area, the H. Channon Co. has been added to the list of jobbers and in addition to a complete stock, eight pages of their new catalog features these products.

\*\*\*

### HOLMES JOINS STAFF OF UTILITIES INSTITUTE

In order to provide for the increasing demand for its training service, Utilities Engineering Institute has recently augmented its engineering staff by the employment of John M. Holmes of Baltimore, Maryland. Mr. Holmes received his education at Johns Hopkins University, specializing in thermodynamics, theoretical and practical mechanics, advanced study of heat and radiation, analytical geometry and differential, integral, calculus, advanced electricity and magnetism. He is also a graduate of Utilities Engineering Institute.

He was president of the Delta Upsilon Fraternity at Johns Hopkins for the year 1928.

Mr. Holmes will specialize in the theoretical phases of refrigeration and air conditioning, for which his education has well qualified him.

Other members of the engineering and instruction staff of Utilities Engineering Institute are R. L. Hendrickson, Dillon Burroughs, Karl Von Kampen, E. O. Paetsch, R. S. Moser and W. J. Mahaffey, all of whom devote their entire time to the training of students of the Institute, whose courses consist of home study combined with shop practice.

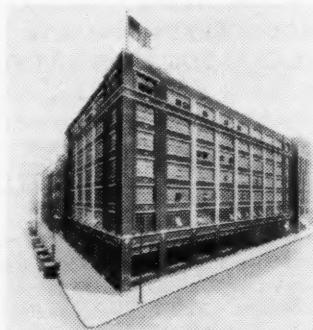
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### NEW PARTS HOUSE

THE H. Channon Company, Chicago, who for the past 61 years have been one of the leading industrial supply houses of the United States, have just opened a complete refrigerating and air conditioning supply department. This department will be under the able management of Mr. H. S. Dekker, who is well known to the members of the

Refrigeration Service Engineers' Society.

Mr. Dekker, when interviewed, stated the policy to be one of 100 per cent wholesale operation, selling only to refrigeration service engineers and contractors. He further stated that a new catalog would be ready for distribution immediately, which would be gladly sent to this class of clientele.



HOME OF THE H. CHANNON CO.

This firm has also opened a large store in Chicago, where they will carry at all times a complete line of refrigeration and air conditioning supplies. The personnel consists of competent employees who understand the refrigeration business. This store, situated at the corner of Randolph Street and North Wacker Drive, has entrances on both streets where cars and trucks may be parked. The stocks and counters are laid out for ample display and examination of merchandise. Attractive show windows with interesting exhibits attract the passer-by. It is believed these displays will be of great service in making the general public refrigeration and air-conditioning-minded.

#### City Deliveries

For city deliveries the company operates a fleet of six trucks. A well organized packing and shipping department insures rapid service on out-of-town orders.

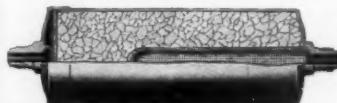
It is expected that H. Channon Company through its years of experience in the supply business will make a welcome addition to the strong and reliable firms catering to the refrigeration service engineer and contractor.

## NEW HENRY LINE

THE Henry Valve Company, Chicago, announces the introduction of a new line of dryers, strainers, large Freon and methyl chloride shut-off valves and relief valves. It is said that because of the extraordinary number of types, sizes, and fitting combinations obtainable, this is the most complete line in the industry.



Drawn copper shell dehydrator with single soldered joint.



Drawn copper shell dehydrator with single soldered joint. Dispersion tube which is connected to inlet end and exposes entire volume of dehydrant to penetration by refrigerant.



Dehydra-tector, the dryer with the liquid sight port—an exclusive Henry product.

The new Henry dryers have a number of features of interest to the refrigeration engineer. The shells of dryers up to  $5\frac{1}{2}$ " in length, are made of copper and drawn in dies. The use of dies eliminates one of the end joints on the dryer shell, with the result that the possibility of leaks is reduced to a minimum. A stamped cap is soldered to the other end of the drawn shell in certain types of dryers, while in other types a distortion-proof tongue-and-groove flanged gasketed joint is furnished at one end of the shell for convenience in refilling. Dehydrators of various lengths, having a dehydrant capacity up to 328 cubic inches and a shell diameter up to  $4\frac{1}{8}$ ", are now available.

All dryers, except the smallest size, are equipped with dispersion tubes which, the manufacturer states, expose the entire volume of dehydrant to penetration by the re-

frigerant, with the result that the drying process is greatly accelerated and maximum efficiency is obtained. According to the manufacturer, tests have brought out the interesting fact that the use of a dispersion tube in a dryer results in only 10 per cent of the pressure drop found in dryers, employing the more conventional construction of filter pad and screen assemblies at each end.

Service engineers are given wide latitude in their selection of dehydrants by the manufacturer, inasmuch as all of these dryers may be obtained, filled with any one of the following dehydrants: Activated alumina, anhydrous porous calcium chloride, calcium oxide, drierite and soda lime.



Small strainer with hemispherical screen. 50% more strainer capacity.



Small strainer with single soldered joint and drawn copper shell.



Strainer with asbestos sack and flanged shell—for exceptionally fine filtering.

The new series of Henry strainers is most comprehensive, embracing different designs, capacities, and fitting sizes for every refrigeration requirement. Drawn copper shells, either soldered or flanged at the inlet end, are used exclusively in these new strainers. For installations, where an exceptionally fine degree of filtering is required, strainers with asbestos sacks are furnished.

*(Continued on page 60)*

# The REFRIGERATION SERVICE ENGINEER

A Monthly Illustrated Journal, Devoted to the Interests of the Engineer Servicing Refrigeration Units, Oil Burners and other Household Equipment.

Vol. 4 April, 1936 No. 4

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*Official Organ*  
**REFRIGERATION SERVICE ENGINEERS' SOCIETY**

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## GOOD PROSPECTS

DEVELOPMENTS occur fast in the refrigeration business, and we are particularly interested in those developments that directly affect the men engaged in the servicing and installation of refrigerating equipment. We are concerned with their future prospects, the stability of the servicing business, and in what channels our efforts should be directed in order to further the interests of the group we seek to serve.

No one will question the possibilities of the business for many years to come. The important thing to consider, we believe, is getting the business of servicing established on a substantial basis so that it will yield a fair return to those who have selected it as their business interest.

The network of service individuals and service organizations extending to all parts of the country offers a huge organization capable of performing a real service for many manufacturers whose manufacturing and sales organization is in a position to do a national business, but who will find it impossible to support a service organization of such expense. To develop such an organization may require too much time at the sacrifice of potential sales. Some manufacturers have been quick to recognize that this servicing organization is theirs to command and are consequently increasing their selling possibilities. It offers an ideal contact, and in practically all cases, at a more economical cost than the establishment of a manufacturer's direct service department. It certainly is another definite indication of the substantiality and possibilities of this business for those individuals and organizations who have prepared themselves to place their business, no matter how small, on a business-like basis, and who are employing every means to keep themselves advised of the advancement the industry is making.

The service organization which expects to interest the manufacturer in his service facilities must be in a position to show that he has maintained a position of responsibility in his community. This, the manufacturer considers of the utmost importance, because field service men will act as his representatives, not only in service, but to keep the customer sold on the manufacturer's product.

## REFRIGERATION SERVICE ENGINEERS' SOCIETY

Official Announcements of the activities of the National Society and Local Chapters appear in this department as well as articles pertaining to the educational work of the Society.



### THE OBJECTS OF THE SOCIETY

To further the education and elevation of its members in the art and science of refrigeration engineering; with special reference to servicing and installation of domestic and small commercial equipment; for the reading and discussion of appropriate papers and lectures; the preparation and distribution among the membership of useful and practical information concerning the design, construction, operation and servicing of refrigerating machinery.

ASSOCIATION HEADQUARTERS: 433-435 North Waller Ave., CHICAGO, ILL.

## *Second Annual Convention Memphis, Tenn., November 11, 12 and 13*

### Twin Cities Chapter Applies for Charter

At an enthusiastic meeting held on one of the coldest days of the year—February 18—a large representation of service men of the Twin Cities attended a meeting to consider the possibilities of forming a Twin Cities Chapter of the R.S.E.S.

The meeting place for the initial group meeting was furnished through the courtesy of Mr. H. W. Small, president of the Thermal Service Co., Inc., of St. Paul, Minnesota. This meeting was held at the offices of the above company at 2490 University Avenue, St. Paul.

Mr. H. T. McDermott, national secretary of the National Society, was present to address the group and to explain the purposes and objects of the organization and the advantages to be derived from the formation of a local chapter affiliated with the National Society. After his talk, a general discussion took place among those present, bringing out several important matters as to how a local chapter could serve the individual membership. At this meeting a committee was appointed to consider the Constitution and By-laws for a local chapter and to report back at a meeting one week later, on February 25th.

Because of the work Mr. Small had accomplished, it was proposed that he serve as temporary chairman until the closing of the charter at which time the regular officers are to be selected for the guidance of the chapter.

Subsequently the Constitution and By-laws of the local chapter were adopted and formal application for a charter was forwarded to the National Society.

#### Charter Closes April 14

It was decided to hold open the charter until April 14, on which night an educational program, consisting of a demonstration of sweat fittings by a representative of the Mueller Brass Co., will be given.

The National organization looks forward to the active participation of the Twin Cities Chapter in the constructive progress of our National Society. All service men in the vicinity of the Twin Cities desiring to affiliate as charter members of this chapter are urged to contact Mr. H. W. Small at 2490 University Ave., St. Paul, and be in attendance at the meeting of April 14, which will be held at the above address.

## MEMBERSHIP CAMPAIGN NOW IN FULL SWING

FROM now until July 1st is going to be an active period for all chapters. Each chapter, regardless of size, is going to have an equal chance to secure one of the prizes that have been offered by the National Society for the best showing in the number of new members that it secures.

The first prize will be \$25.00 in cash or a mimeograph machine capable of printing the notices, bulletins or other information sheets which the chapter desires to prepare for its membership. The second prize will be \$15.00 in cash; third prize, \$10.00 in cash. The contest will end on July 1st, and the National Offices assure their cooperation in helping each chapter to secure one of the prizes offered.

It has been further suggested that each chapter, in order to secure the interest of its individual members, present one of the attractive R.S.E.S. lapel buttons to each member who brings in two new members, or to give a year's dues (to be applied on account) to each member who brings in five new members, including the two for which he received the button.

The Membership Campaign is on, so each member is urged to contribute his share to the success of his local chapter.

\*\*\*

### AN OPEN LETTER

*To all readers of  
THE REFRIGERATION SERVICE ENGINEER.*  
Dear Reader:

Spring is here at last after a long and hard winter for the refrigeration business as well as for everybody else, and at this time of the year our thoughts naturally turn to the ice machine business and to what we are going to do during the next six months.

All the manufacturers have been tuning their plants up to take care of the production of new models and are working overtime to get everything set for the grand rush which is coming on now. The dealers have spent the last four months looking over the various lines and deciding what would seem to be the best bet for 1936. Salesmen have been studying literature by the ton, so they

may know all about their line and also so they may know the shortcomings of other lines.

But, what have *you* been doing to keep up with everybody else?

Ask yourself that question and see what the answer is.

Yes, I know, you read the trade papers and the literature you receive from the manufacturers, etc., but are there not many questions you have in mind which are not discussed in the trade papers? How often have you looked for some special information and not been able to find it? I will leave the answer to yourself again.

If you are one of the many readers of this magazine who wish to increase their knowledge of refrigeration engineering as time goes on, the sure way to do it is by belonging to the recognized Society of the field in which you are working.

The *Refrigeration Service Engineers Society* offers you this opportunity.

This association is the only recognized Society in the refrigeration service field which gives you a complete course in the science of refrigeration service engineering. It gives you answers to your questions pertaining to your work. It gives you opportunity to associate with members from all the various branches of the industry, and it gives you a background which you can get only by belonging.

For a few dollars a year you may have all the benefits of a real organization, which in less than three years has grown to number nearly a thousand members, which has held two conventions and is going to hold a third convention in Memphis, Tennessee, next November.

You will, of course, receive the magazine which you are reading now, as well as a monthly lecture course, as I mentioned above, and if there is a chapter in your community, you attend regular meetings. If there is no chapter in your city, then why don't you find out how one may be established?

There are a thousand and one little things you receive by being a member here which you will never get otherwise.

*Why not join us now?*

We want to make this Society a common meeting ground for all those who are in the refrigeration business and we solicit your inquiry as to how you may become a member, and how little it costs you to say "I am a member of the R.S.E.S."

Cordially yours

PAUL JACOBSEN, *National President.*

\*\*\*

### DETROIT CHAPTER

By L. R. BURNS, *Secretary*  
139 Newport Ave., N., Detroit, Mich.

WHILE Detroit Chapter has not been heard from in our Official Organ lately, we assure the National Society that the old stand-by members are working in the interests of a bigger and better chapter. At our meeting of January 8, the following officers were elected: President, Wm. G. Euth; 1st Vice-president, Paul Mercer; 2nd Vice-president, James A. Wood; Secretary-Treasurer, L. R. Burns. Mr. George H. Clark, the National Educational and Examining Board chairman, was retained as chairman of the local Educational Committee.

On the 4th of February, Mr. Merkle of the Ranco Co. gave a talk on controls but unfortunately the sub-zero weather kept many of the members from being present. We hope to have Mr. Merkle again with us when we have a much larger and more representative attendance of Detroit Chapter.

On February 26 an inaugural dinner was given by the parts distributors of Detroit, consisting of W. C. DuComb, Inc.; J. M. Oberc, Inc., and the Young Supply Co. It was one of those successful events and all of the members reported an exceptionally fine time. It is hoped that events of this character can be held more frequently.

Detroit Chapter reports with considerable regret the passing of one of its oldest members. Mr. Andrew Stevens passed away after a brief illness.

\*\*\*

E. J. Kerby, Service Manager,  
Iowa.

Enclosed you will find \$2.00 for the renewal of my subscription for the *SERVICE ENGINEER*. I think there is no finer publication and would feel completely lost if I did not receive the *SERVICE ENGINEER* month by month. Keep up the good work.

### CHICAGO CHAPTER TO HOLD THIRD ANNUAL BANQUET

COMMITTEES are busy at work in Chicago Chapter preparing for the Third Annual Banquet, which promises to be an event that will long be remembered. The banquet, which will be held on Saturday evening, April 18, at the Stevens Hotel, will include about everything that anyone could ask for—wonderful food, plenty of entertainment, dancing, and a good time for all. The event has been planned for some months.

### NOW GOING TO PRESS!

*Big, New 1936 Wholesale Catalog of*

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*SERVICEMEN AND DEALERS*

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Ask Us*

**COLMAN J. MULLIN**  
52 Church St. New York

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One to three months opportunity to master theory and practice of all-make service department management.

**Refrigeration •  
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Oil Heating and Burners •  
Installation •**

In New York City's first service school you meet men from the world over, learning the latest metropolitan service routine. Apply 1819 Broadway.



**The Scientific Air Conditioner for Refrigerators**

Absorbs odors... purifies air... keeps refrigerators sweet and clean... Prevents contamination of foods... Write at once for further information and prices.

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The admission will be \$2.50 per person. Complete reports of the success of the event will be published in the next issue of



HOME OF CHICAGO CHAPTER—STEVENS HOTEL

THE REFRIGERATION SERVICE ENGINEER, and all service men in the vicinity of Chicago are invited to be present.

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**HERMETIC UNITS & PARTS  
REBUILT OR EXCHANGED**

Majestic—all models ..... \$17.50

Servel—all models ..... 19.50

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Majestic Standard Compressors, exchange price 6.50

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Wholesale Only

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**KANSAS CITY CHAPTER HOLDS  
FIRST ANNUAL DINNER DANCE**

After considerable planning, Kansas City Chapter held its first annual dinner dance, and the success of this initial enterprise forecasts the holding of this affair as an annual event in Kansas City Chapter.

Much credit is due the officers for the success of this event; particularly to Mr. H. L. Green, first vice-president, as chairman of the Entertainment Committee.

Although the weather was extremely cold on February 19 when this event took place, about forty couples journeyed to the Lee Erb Cafe, located south of Hickman Mills, and enjoyed plenty of good food and music.

It served as an excellent medium to better acquaint the members and families of Kansas City Chapter. Although the arrangements were not definitely decided upon until about one week in advance of the announced date, nevertheless all who attended voted the gathering a huge success.

Included among the members and guests



**Door  
Gaskets**

All rubber and rubberized fabric, for commercial and household refrigerators.

*Inquiries invited*

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Place yourself head and shoulders above rule of thumb mechanics. Be a technically trained Refrigeration Technician.

Interesting and valuable facts FREE for the asking. Write today.

**UTILITIES ENGINEERING INSTITUTE**  
404 N. Wells St. 17 W. 60th St.  
Chicago New York, N. Y.

were a number of distributors of refrigeration supplies and parts in Kansas City, consisting of Mr. L. H. Roberts of Forslund Pump & Machinery Co., Mr. Chas Anderson of Imperial Brass Co., Mr. M. W. Applebee of Burstein-Applebee Co., and Mr. Wickstrom of Prier Brass Co., who expressed their pleasure at the progress Kansas City Chapter is making, and the good fellowship which prevailed.

Service men of Kansas City and vicinity, who are not members of our chapter, are cordially invited to come and meet with us.

**CARL SCHNEIDER CO.**

*"Serving the Middle and Southwest"*

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SUPPLIES & ACCESSORIES**

**Office and Warehouse  
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ST. LOUIS, MO.**

**MEET J. H. RIEHLMANN**

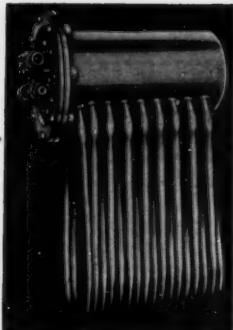
THIS is the gentleman who is chairman of the local publicity committee. His duties are to obtain favorable publicity for the R.S.E.S. in the Memphis trade area; also local or Tri-State advertising for the national R.S.E.S. convention to be held in Memphis, November 11th, 12th and 13th.

Mr. Riehlmann says: "My particular job is to observe and to pass on to those interested my observations and impressions. Therefore, it is necessary for me to attend all meetings held by the various committees.

"I wish I could portray the enthusiasm that is being exhibited by the various com-



DINNER DANCE GIVEN BY KANSAS CITY CHAPTER, FEBRUARY 19



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...in the fine art of recalibration of float valves and the silver soldering of evaporation coils . . . for all makes of Ice Cream Cabinets.

WE MANUFACTURE AND REPLACE . . . Monel Tops Enamel Panels • Tanks Rims and Rim Sleeves . . . all other parts for all make cabinets.

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A Division of Standard Body Corp.  
430 E. 104th Street, New York  
Write for Details



mittees appointed by our local president, Mr. George Uetz. It really looks as though



J. H. RIEHLMANN  
Chairman, Memphis Publicity Committee

they were contending for a prize to be given to the committee making the best showing, but the most gratifying part to us all is the spirit of co-operation that exists between all

the convention committees and members.

"To stress the point I wish to put over, may I say that with the tremendous amount of work being done and the efficient systematic manner in which it is being planned and executed, it is bound to result in the best convention we have ever had as an organized unit or society.

"Those who find it impossible to attend will always regret it. Let me suggest that you watch for the next month's issue of this magazine for the complete announcement of the entertainment committee's plan for the ladies, visitors and friends and I feel that you will agree to lend your support by giving

### 'YOUR PERSONAL ATTENDANCE'

"Fall in line by making your plans to spend your vacation in Memphis. Attend the third convention of the R.S.E.S. and partake of *real Southern Hospitality*."

Not only will it be an enjoyable vacation, but the educational program will mean much to your advancement in this business.

Condensing Unit  
Style D7-MA



## STARR FREEZE

DEPENDABLE COMPRESSORS AND CONDENSING UNITS

1-2-4 Cylinders— $\frac{1}{6}$  to 10 H.P.

The most profitable and complete line to select from—just the size to build that refrigerator,—to assemble that condensing unit or to replace that old worn-out compressor.

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REFRIGERATION or 222 North Vermont Avenue  
SINCE 1927 Los Angeles, Calif.

ESTABLISHED  
IN 1872



Compressor  
Style J

# REMPE COILS

## FOR AIR CONDITIONING UNITS

Built to last, to give efficient, trouble-free service for years, to do your every heating or cooling job perfectly.

Also any type of extended surface coils made with Aluminum, Copper and Steel Fins on Copper and Steel Tubing . . . Expansion Valves . . . Pipe Bends and coils.

New Catalogue now in production . . . watch for it

### REMPE "FIN COIL" COMPANY

340 N. Sacramento Boulevard

CHICAGO, ILLINOIS

#### YOUNGSTOWN CHAPTER

Meeting of March 2, 1936

By MARTIN BOKESCH, JR., Secretary  
R. F. D. 5, Youngstown, Ohio

THE meeting was called to order by

Vice-President Butler, in the absence of President Keith, who was ill.

Mr. Sanders moved to appoint a sick committee. Mr. Eich seconded. Mr. Eich moved that the sick committee be empowered to purchase flowers, fruit, or other gifts for sick members.

Mr. Eich, acting for President Keith who was scheduled to give a talk on high side floats, gave the talk instead.

Secretary read a letter from the National Secretary, H. T. McDermott, informing the members of the resignation of National President Downs and Mr. Jacobsen replacing him as Acting-National President.

Mr. Wright read the preliminary draft of the licensing petition drawn up for approval by members of the society.

Mr. Eich moved that Mr. Wright be empowered to complete the draft of the peti-

tion, and get it in readiness for presentation to the City Council.

Vice-President Butler appointed the following to act as the sick committee: Messrs. Chas. Eich, Ed. Wright, J. King.

#### Meeting of March 16, 1936

The meeting of March 16 was called to order by Mr. C. P. Eich in the absence of both President Keith and Vice-President Butler, and the usual business was disposed of.

Names of members were listed according to their financial standing in the Society. Ideas and methods pertaining to keeping members in good standing were advanced and discussed.

Mr. Eich, chairman of the Visiting Committee, reported that he had visited Mr. Keith. Mr. Keith is now home and feeling much better. He is expected to be up and about within two or three weeks.

Mr. Remaley's talk on "Temprite Coolers" has been postponed to April 6, our next meeting.

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Replacement parts for all makes of refrigerators and air conditioning carried in our Dallas warehouse for immediate shipment.

**100% WHOLESALE**

THE BECKETT ELECTRIC CO., INC.  
2118 Griffin Street, Dallas, Texas

### PITTSBURGH CHAPTER

Meeting of March 9, 1936

By F. V. GOLITZ, Secretary  
1518 Davis Ave., Pittsburgh, Pa.

THE regular meeting of Pittsburgh Chapter was held on March 9 in the Corporation Room of the Commonwealth Building, President C. O. McCauley presiding.

The meeting was opened with a lecture by Mr. M. F. Gross, a member of Pittsburgh Chapter and service manager for the Norge distributor in western Pennsylvania, The Ludwig Hommel Company. Mr. Gross' subject was "Servicing the Norge." The lecture was illustrated with a large wall chart and covered all the important details of construction and service features of the Norge line. Mr. Gross stressed the need for a better understanding between the independent service man and the distributor. He brought out the fact that the distributor often has reason to complain and be distrustful of independent service due to the antagonizing of the customer by poor service, over-charges, etc.

This type of service inevitably leads to an unfavorable attitude on the part of the customer to the distributor's product with the result that both the service man and the distributor lose the good will and the business of the customer. Mr. Gross stated that distributors as a rule are willing to cooperate in furnishing information and service parts to qualified service men who call on them with their service problems. The lecture was closed with the answering of questions by Mr. Gross. An enthusiastic round of applause was given Mr. Gross for his interesting and instructive lecture.

The business meeting was opened with the reading of the minutes of the previous meeting, which were accepted as read. The correspondence was then read by President McCauley.

Mr. R. P. Weston was next introduced and spoke for a large group of independent service men, many of whom were present. He asked that the men be permitted to join the Pittsburgh Chapter and cooperate in setting minimum prices in order to stop cut-

TYPE KR-12 Models  
**RANCOSTAT**

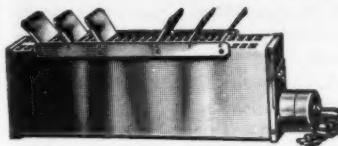
Have you ever compared the ingenious construction of Rancostat's overload unit with others? Write for KR Bulletin. Shows how ceramic cylinder enclosing heating coil, fits perfectly in solder well. Can't change its position. Always dependable overload protection.

Automatic Reclosing Circuit Breaker Company, Columbus, Ohio

For quick replacements and satisfied customers—



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- ✓ Installed in a minute's time in counter cases and reach-in boxes.
- ✓ Lowers temperature 8 to 12 degrees.
- ✓ Positively prevents taste transfer.
- ✓ Maintains color and firmness of meats.
- ✓ Stops sweating.
- ✓ Uniform temperature and humidity.
- ✓ Retails for \$26.50.

throat competition. In reply Mr. McCauley pledged the support of Pittsburgh Chapter to the end that such practices be stopped. He pointed out that until the men joined the R.S.E.S. no help could be given this group, but as active members a great deal could be accomplished to bring about a change in conditions. On motion of Mr. Kirch, seconded by Mr. Ricci, it was decided to call a special meeting on March 28 to bring together as many of these independent service men as possible to go over these problems and to afford them the opportunity of joining the R.S.E.S.

Mr. McCauley appointed the following as Committee Chairmen: Cost Records Committee, M. F. Gross; Standards Committee, John Kirch; Investigating Committee, V. C. Waight; Membership Committee, F. V. Golitz.

\*\*\*

R. Stone, Rhode Island.

Don't let my subscription lapse. Here is my remittance.

## CHICAGO CHAPTER

Meeting of March 10, 1936

By H. D. BUSBY, Secretary  
5611 Lawrence Ave., Chicago, Ill.

THE meeting was opened by Mr. Hendrickson with the usual half-hour discussion of the Lecture Course.

On its completion, Mr. Pemer of the Minnesota Mining and Mfg. Co. spoke briefly on lapping compounds for refrigeration work.

The meeting was then turned over to our President, Mr. Jacobsen, who called for a report from Mr. Goldberg on the Entertainment Committee. Mr. Goldberg outlined the arrangements which have been made to date for the Annual Banquet. There are 1,000 tickets printed and ready to be sold. In addition to these, there will be a program in which advertising will be sold. To the member securing the sale of \$25.00 or more in tickets or ads 10 per cent will be paid in the form of a ticket, or tickets, to the banquet. Mr. Goldberg then appointed the va-

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and INSTALLING  
ALL MAKES OF  
REFRIGERATION  
EQUIPMENT**

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*Large and complete stock. Quick delivery. Catalogs on request.*

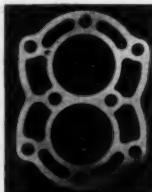
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**Replacement  
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A real service for servicemen. We carry in stock, gaskets for old and new models of practically every unit ever built. 24 hour chipping service.

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**WE ARE PROUD**

that our graduates whom we have placed in Engineering Laboratories, air conditioning sales, refrigeration accessories sales, refrigeration and air conditioning service, and the more particular work in refrigeration factories have made good without exception. We are proud that our students are all satisfied that they have received the best training available that the better business bureau has not received a single complaint about us, that we are the only licensed school to teach these subjects in Michigan, and that Employers have confidence that men we furnish them will succeed.

**DETROIT SCHOOL OF  
REFRIGERATION**  
**6517 Grand River - Detroit, Mich.**

rious committees which are to help him in the handling of this banquet, as follows:

I. Skipple and H. Armstrong—In charge of tickets; receiving and accounting of tickets.

H. Drownes—Ticket sales promotion; mailing of tickets.

R. L. Hendrickson—Advertising pluggers, etc.

Warren Mills—Program Committee.

H. J. DeGan, P. C. Krueger, E. Geiser—Reception Committee.

H. D. Busby—Treasurer.

It was suggested, and the matter discussed, that shops whose owners are members of the Society be given listings in the program at a nominal cost of 50c or \$1.00, according to the cost of the printing.

Mr. Goldberg suggested, and it was agreed, that refreshments be served at the next meeting.

The long-sought examination papers were finally secured and passed out to their originators for scrutinizing with instructions that they must be returned for file to Mr. Jacobsen and that they should be kept strictly confidential.

Mr. Jacobsen announced the receipt of letters from an eastern manufacturer requesting the list of our member shops for the purpose of selecting some who are in a position to handle their service work. Mr. Jacobsen requested these shops to register with him if they are desirous of securing such work. Further information on this matter will be forthcoming.

As a further inducement to securing new members, for every two new members secured by a member there will be an award of a membership button. To the members securing five or more members there will be awarded a free membership either for the current year or for the year 1937.

**Meeting of March 24, 1936**

Mr. Jacobsen presented for approval a draft of signs to be made up soliciting membership in the Chicago Chapter and suggested that they be posted in all parts houses. After favorable discussion which followed, the matter was turned over to the Membership Committee to arrange for the signs to be made.

The report from Mr. Goldberg for the Entertainment Committee outlined the work done to date in the arrangements of the Annual Banquet. Mr. Goldberg called upon his various subcommittees for their reports, and future activity in the matter was outlined.

The meeting was then turned over to Mr. Hendrickson for the educational program. He called upon Mr. Kranz of the Binks Mfg. Co. to give a talk on "Atmospheric Spray Cooling Towers." Mr. Kranz illustrated his talk with enlarged photos and sketches on the blackboard.

Mr. Jacobsen introduced several visitors for the evening and extended to them our feeling of hospitality.

\*\*\*

### CHICAGO CHAPTER CHATTER

By HERMAN GOLDBERG

—Notice is herewith served to all members of our organization and their friends that the date of our annual banquet will be April 18th at the Stevens Hotel. Price per person will be \$2.50. This may seem like a lot of money to some, but there is going to be a lot of entertainment, food, and a good time, and this cost will just cover the expenses.

—The Entertainment Committee is confident of a very large turnout of not only our members but also our many friends. Do your share and do a lot of boosting for this affair.

—Social Event. The DeGans called on the Monjians one evening several weeks ago with the baby, which Harry carried in his arms. On being greeted by Mrs. Monjian, Harry absent-mindedly put the baby on the floor in the hallway and they all walked in, minus the baby, and waited for George to arrive, who seemingly was out late but was expected momentarily. On opening the door to his apartment later, George stumbled over the baby and promptly lost a part of his pants. It seems that the baby turned out to be a three-month-old bull terrier, wrapped up in sweaters.

—A refrigeration service man, who incidentally is not a member of our chapter, was arrested for becoming involved with one of his customers. Upon being pulled in

**WORLD-WIDE SERVICE**  
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**66 Distribution Points**  
assures  
prompt deliveries  
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**EXTRA DRY ESOTOO**

(Liquid  
Sulphur Dioxide)

Not merely easy to get, but highly economical and satisfactory to use, Extra Dry ESOTOO is deservedly popular with Refrigerator Manufacturers and Service Men, who recognize it as a refrigerant of known quality and proven merit.

Insure customer-satisfaction by standardizing on Extra Dry ESOTOO—the purest, safest sulphur dioxide for domestic refrigeration!

The coupon will bring you interesting information; and you are invited to consult with us on any refrigeration problem.

●

**Virginia Smelting Co.**  
**West Norfolk, Virginia**

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F. A. EUSTIS, Sec'y,  
**VIRGINIA SMELTING CO.,**  
131 State St., Boston, Mass.

Send me the literature I have checked. I am interested in receiving any additional literature on Electrical Refrigeration you may issue from time to time.

Folder: Extra Dry ESOTOO (Liquid Sulphur Dioxide)  
 Folder: V-METH-L (Virginia Methyl Chloride)  
 Folder: Transferring from large to small cylinders  
 Circular: Physical properties of various refrigerants

Name .....

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# NEW CATALOG No. 10 *COMPLETE*

## REFRIGERATION and AIR CONDITIONING PARTS and SUPPLIES

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**H. CHANNON CO.**

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*Nationwide Wholesale Distribution from  
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front of the court to answer charges, the judge promptly dismissed the case, saying that the defendant had been punished enough. It appears that the boy picked the wrong woman. She was just about three times his size and beat him up before the police could get there to rescue him. There might be a moral to this.

—There being nothing else to write about in particular, we sign off again until next month, but don't forget to call me at my office, Austin 6348, or stop in at 5101 W. Madison St.

\*\*\*

### KANSAS CITY CHAPTER

Meeting of February 25, 1936

By R. E. KINGSOLVER, Secretary  
2212 E. 38th St., Kansas City, Mo.

THE meeting was called to order by President Roy Cox, followed by roll call of the officers which showed Mr. Ransdell, sergeant-at-arms, as absent.

Roll call of members followed. The minutes of the meeting of February 11, 1936,

were read and approved. Mr. Green, chairman of the Entertainment Committee, reported on the dinner dance which proved to be a great success, with forty couples in attendance.

A letter from the National Secretary, Mr. McDermott, announcing the resignation of the National President, J. H. Downs, was read by the Secretary.

Mr. Forslund of Forslund Pump and Machinery Company, who was present for the first meeting which he has attended, was called upon by President Cox for his comments.

The meeting was turned over to the Educational Program and Mr. Green introduced Mr. G. L. Shrode, President of Aleo Valve Company, who gave a lecture on expansion valves.

\*\*\*

### ST. LOUIS CHAPTER

Meeting of February 13, 1936

By J. D. GRAY, Secretary  
2512 Summit Ave., E. St. Louis, Ill.

THE regular meeting of the St. Louis Chapter of the R.S.E.S. held Thursday,

February 13, 1936, at the Crunden Branch Library, 14th and Cass Avenue, was called to order by President Plesskott at 8:30 P. M.

President Plesskott then announced the resignation of National President J. H. Downs, and a motion was made and seconded that Secretary Gray write Mr. Downs and express regret of the Chapter in losing him and wish him all the success in his new business connection.

Secretary Gray, who is also Chairman of the National Membership Committee, spoke on the National membership drive, urging the members to work for a goal of 100 per cent gain in membership. Considerable progress was reported.

Mr. Gygax, chairman of the Educational Committee, then introduced the speaker of the evening, Mr. E. Roger Hewitt, who gave the first of a series of talks on Air Conditioning.

#### Meeting of February 27, 1936

A letter from the Community Council offering speakers on a number of subjects was tabled, due to the fact our programs

for several meetings in advance are already arranged.

By request of the chair a motion was made by Mr. Nettler, and seconded by Mr. Petri, that only an affirmative vote of the majority of officers present at any regular meeting shall be necessary for the drawing of a warrant for the payment of monthly expenditures not exceeding \$15.00 in the aggregate.

Secretary Gray then spoke, urging all members to pay their 1936 dues as soon as possible.

Mr. E. Gygax, chairman of the Educational Committee, introduced the speaker of the evening, Mr. Spielman, "Ranco" engineer, who gave us a very interesting and helpful talk on controls.

\*\*\*

#### MEMPHIS CHAPTER

Meeting of March 2, 1936

By R. F. WEIDLEIN, Secretary  
765 Ellsworth, Memphis, Tenn.

As usual the meeting was called to order by President Uetz promptly at 7:30 P. M. Roll call of officers by our husky Sergeant-at-arms showed four in attendance.

## A New Set and a New Bulletin Needed by Every Refrigeration Man



A complete Set of Refrigeration Sockets and Handles—including ratchet—19 pieces in all—to take care of practically every refrigeration service job.

That is just one of the many items shown in this new bulletin illustrating the most complete line of refrigeration maintenance tools ever produced by one manufacturer.

You need this set and you need this bulletin. For full information write

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BONNEY  
FORGE and TOOL WORKS  
Allentown, Pa.

Member Refrigeration Supplies & Parts Mfrs. Ass'n.

The petition of William E. Sudlow, independent service man, was read to the chapter. As this petition had not been acted upon by the regular examining committee, President Uets appointed Mr. Riehmann, Mr. Bridges and Mr. Woods as a committee to examine this petition.

Reports of committees:

Visiting committee reported Mr. R. J. Rick still unable to be out. Mr. Tommy Wilson was also reported ill and asked that all of the boys who could visit these fellows.

Finance committee reported in behalf of the entertainment committee that they understood that only six or seven ladies had attended the two meetings which had been held. Mr. McDowell urged all of the boys to make a special effort to get their wives, sweethearts, sisters, mothers or some representative to attend all of these meetings. It was also reported at this time that the ladies would meet in our chapter room at 2:30 o'clock March 10th.

Communications from the National Secretary's office were read and, upon a motion

by McDowell, which was seconded by Bruce Hale, the first communication read was ordered filed.

At this point roll call was taken which showed twenty members and two visitors in attendance. The visitors were Mr. Sudlow and Mr. Elliot.

The Secretary passed out several Membership Cards and Certificates and asked that as it was March 1st, it was time for the balance of the boys to start paying their 1936 dues. Several of the boys paid the thirty-five cents due on special assessments.

Our educational chairman, Mr. Easley, took charge at this time and I believe more interest was shown and more good derived from this meeting than at any we have had in the past with the possible exception of the nights when different manufacturers' representatives were present and gave lectures. We only hope that every meeting can be as successful, so that we can show Bill that we really do appreciate his efforts as our educational chairman.

Mr. Easley announced that a speaker

## "Chieftain" Quality Built Compressors



### and Condensing Units



See Your Jobber

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Save money by installing "Chieftain" Compressors instead of trying to satisfy exacting customers with rebuilt compressors or condensing units.

"Chieftain" Compressors are made to last. Precision limits are maintained on all parts. Our new and exclusive lubrication system insures longer life and higher efficiency, as well as a quiet operating unit.

In addition to quality we offer prices that will permit you to make a higher percentage of profit as well as a saving of time, which will enable you to satisfactorily handle a larger volume of business.

**TECUMSEH PRODUCTS COMPANY, Tecumseh, Michigan**  
*Refrigeration Division*

# THE SECRET IS OUT!

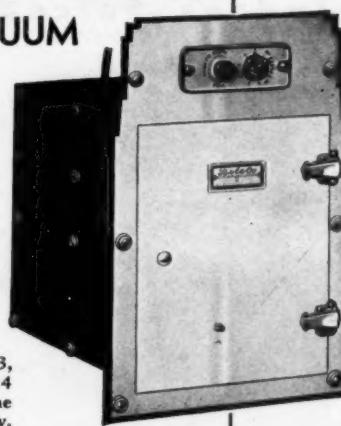
## IT'S ALL IN THE VACUUM

The secret of faster cooling and greater efficiency with DoleCo Evaporators is to be found in the exclusive Patented Vacuum Plate construction.

The smooth plates take up less room than coils or fins and are more easily cleaned and sanitary.

Increase your profits and deliver positive customer satisfaction by replacing with DoleCo Evaporators. Write for Bulletin E.

No. 1001—Conventional Type. 2, 3, 4, or 5 trays. Dessert tray with 3, 4 and 5 tray models. 28 cubes to the shallow tray; 56 cubes in dessert tray.



**DOLE Refrigerating Co.**  
208 N. Clinton St. Chicago

would be in attendance on our next meeting night, and urged every one to try and have a good attendance on this evening. At this time the meeting was turned back to the regular officers.

### Meeting of March 9, 1936

The petition of Mr. William E. Sudlow was read and upon discussion and the okay of the examining committee, appointed to act upon this petition, the chapter voted that Mr. Sudlow be elected to membership in our organization.

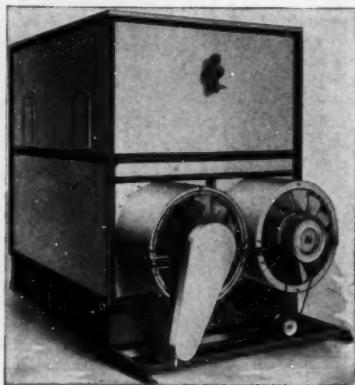
Communications were read to the chapter concerning exhibit space, etc., for the convention, and upon a motion by McDowell, which was seconded by Mr. Scott, the first two letters read were ordered filed. Then a letter from The C. Schmidt Co. was read, in which they asked for the names and addresses of those interested in and capable of servicing and installing Thesco units. At this point the secretary took a list of those interested, which will be sent to the company requesting this information.

Unfinished business: Pres. Uets showed a corrected chart of the exhibit space available at the Gayoso Hotel, National Convention Headquarters. Also a letter from Mr. Riehlmann to all members of the entire organization was read concerning his plans for the local publicity to be given to our National Convention.

In the absence of our educational chairman, Mr. W. C. Easley, our visitor, Mr. E. J. Kimm of The Kerotest Manufacturing Co., was introduced and asked to take charge of our educational program.

Mr. Kimm talked concerning their product and answered various questions regarding same. He then went into a discussion of different kinds of service men, and gave his opinion of the type of men who were successful in their line of business. He emphasized the fact that the man who was clean and orderly in his talk, in his appearance, and in the way he handled his tools would go a long way in the profession, but that no one could succeed or even get by for any length of time unless they "knew their stuff." He said that in the olden days

# BINKS SPRAY COOLING TOWERS Indoor Forced Draft Type Will Save Money for You!



What happens to the circulating water after it passes through your Ice Machine Condensers?

If discharged to waste you are literally pouring good hard earned dollars down the sewer! Check your water bills . . . see how much you are throwing away. You'll be surprised.

A Binks Cooling Tower permits the constant recirculation of the required supply, cooling and using it over and over again and again, substituting a small pumping charge for the former heavy water bills.

There are more than three thousand Binks Cooling Towers now in operation including sizes for all standard commercial refrigeration units. Let us tell you more about it, and how YOU TOO can cut the water costs of your present equipment by as much as eighty per cent.

Write Today for Bulletin No. 70

**BINKS MANUFACTURING CO.**  
3151 Carroll Ave. Windsor, Ontario-Canada

CHICAGO, ILL.

such fellows could get by for a while, but that in this time, as competition was so keen, the man who did not study his product and keep up with the new material coming out was bound to be a dismal failure.

At the end of his discussion Mr. Kimm was given a rousing vote of welcome and appreciation for his remarks.

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## THE BENEFITS OF ASSOCIATION

*(Editor's Note —At a recent meeting of Chicago chapter the following article was presented by President Jacobsen. Because it so clearly expresses the value of association work, we reprint it in its entirety.)*

PRACTICALLY every profession or calling has its association or society. It is the organized expression of the art or vocation which it represents, the correlation of the efforts of its members for greater effectiveness.

One of the first returns to an adherent is the appearance of his name in the roster as an accepted and recognized member of the

craft. It gives him identification and standing. The membership list of a reputable society is a directory of the leaders in its subject. One of the first moves in evaluating a man is to see if he is a member of the leading society in his profession.

And then there is the opportunity for broadening one's acquaintanceship, the making of friends whose work and interest are in line with his own.

And a wide circle of friends and acquaintances is one of the best assets a man can have.

One of the advantages for which one most naturally looks is ideas and information that will be of value to him in his work. This he gets in the papers and lectures presented at the meetings and in their discussion. Often opportunities are open for obtaining solutions to his own immediate problems or suggestions for improvement in plant or practice.

And participation in discussion not only broadens his ideas and widens his mental horizon, but also accustoms him to thinking

on his feet, gives him confidence in speaking and the ability to get his thoughts over convincingly and to make his point interestingly.

Many of the societies publish proceedings, transactions, etc., which contain the foremost thinking of the leaders of the profession and constitute a record of progress and achievement. Many also have periodicals which keeps the member who reads them informed of the news and development and the movement of the leaders in his business.

But the most of these advantages come from active participation in the meetings and work of the society. Simply to join and pay one's dues brings some of them. Passive attendance at the meetings brings more. But the one who gets the most out of his membership is he who takes an active, intelligent interest in the proceedings, who wants to know and wants to help, whose willingness and ability to assist lead to his enlistment in committee work, a more intimate and dominant association with his fellow workers, and reputation and advancement in his calling.

As has often been said, the more one puts into his society, the more—and in multiplied measure—he gets out of it. *Reprinted from "Power."*

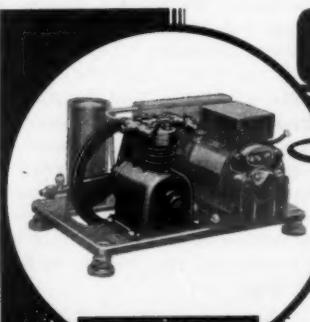
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### "THE CONTRIBS COLYUM"

By THE KINGFISH

THE most pitiful thing about an accident is that it might have been prevented! How true those words are! We see that from everyday happenings—someone is run down by a car on the street—often we find that the motorist's brakes were in poor condition. Why? Carelessness.

A service engineer is killed when a piece of equipment he is testing blows up. Why? Investigation shows he had excessive pressure on his air pressure tank—possibly not even a safety device. You have seen several tanks like that—but it is too late after the accident has occurred. We visited a place of business one day and saw signs all over the place. There was only one word on each sign, and that was the word "THINK."



## COPELAND

*Announces*

A NEW COMPRESSOR EXCHANGE  
PLAN TO MODERNIZE  
PREVIOUS MODELS!

HERE'S a new exchange deal that opens up new channels of profit for service engineers! The 1936 precision-built, twin-cylinder Copeland compressor is now available on an attractive exchange plan. This compressor is the finest ever built by Copeland. Cylinder walls are micro-honed to mirror-smoothness; all bearings are diamond bored. This compressor, with 2 valve adapters and oil charge, will modernize all previous Copeland models from 1919 to 1935. Bolt holes are identically spaced back to 1930 models. For earlier units a sub-base is furnished. Go after this new business. Write at once for complete exchange plan proposition.

COPELAND REFRIGERATION CORPORATION  
HOLDEN AVE at LINCOLN · · · · · DETROIT, MICHIGAN

# the ANSUL twins



*They're  
both*

# SAFE!

**ANSUL**  
CHEMICAL COMPANY  
MARINETTE  
WISCONSIN

No matter where we looked the same word stared at us. We are sure that the workmen there have less accidents because they must get in the habit of thinking of what they are doing at that particular moment, and that is the solution to preventing a great number of accidents.

We hear that Memphis Chapter is installed in its own permanent meeting room now and that they have spent a lot of time and effort to fix it up so the boys may feel that they are at home. More power to you, Memphis! It looks like you are going places!

Did you know that Memphis has a population of 265,000; that their average summer temperature is 80°, and average winter temperature 42°; that they have 140 miles of street railways; that they have 26 hotels; that they have 50,000 automobiles; that the city covers 49 square miles? And don't forget that Memphis is our Convention City for 1936.

Jim Downs is now located in his new position—with Refrigeration Supplies Distributor in Cleveland. Well, that is good news and we sure wish him lots of luck in the sales end of the business.

Looks like it is up to Paul Jacobsen to act as President now, and if I know him rightly you will have to keep him posted on the activities of your chapter as he wants to know what is going on around the country, and the committee chairmen can expect to be requested to show results. Well, Paul has a lot of friends and they will do what he asks them to do.

The new president of Memphis Chapter, Mr. G. L. Uetz, is a publicity man ranking among the best. Immediately upon his election as president, he sends a detailed report of the activities for the coming year and I hope you will all remember that "your personal attendance," as Mr. Uetz says, is of vital importance. When I see someone who is wide awake and wants to do things I always feel that he is the man to support, and I officially make a motion "That every member of the R.S.E.S. give their support and personal efforts to help Memphis Chap-

ter to make this 3rd Annual Convention 'the greatest'."

I would like to hear lots of seconds to this motion in the form of letters from you boys in which you make your suggestions for improvement.

All mail to be addressed to: The Kingfish, 483 N. Waller Ave., Chicago, Ill., and I shall see that your suggestions are given to the proper party and that you be given credit for it. Let's go!

Let me shake your hand, Jack Geering. I congratulate you as the new President of Milwaukee Chapter. May you bring this chapter up to be one of the leading chapters in the country. And my good friend Mr. Gugler is now first vice-president. Well, I don't doubt now that there are going to be some interesting discussions from now on. Glad to see you in the ring, Mr. Gugler!

\*\*\*

### TELEPHONE BOOK ADVERTISING

MEMPHIS CHAPTER has adopted a cooperative plan of telephone directory advertising, wherein members who desire to participate in the listing may have their name and a central phone listed under a brief description of the Society's purposes and emblem.

This matter of phone book listing provides a display advertisement and adds prestige to the individuals listed, therein. The cost to each individual is 50c per month. The advertisement reproduced is approximately the actual size as it appears in the telephone directory.

For "Courteous, Certified Service" on Electric Refrigerators call for one of the following members of RSES and have the assurance of a Recommended Refrigeration Service Engineer. It is a guarantee of satisfaction.



#### "Where to Buy It"

Black A R	943 Madison av.	2-6881
Bridges B L	943 Madison av.	2-6881
Easley W C	943 Madison av.	2-6881
Hunt G E	943 Madison av.	2-6881
McDowell W H	943 Madison av.	2-6881
Moore B A	943 Madison av.	2-6881
Moss W H	943 Madison av.	2-6881
Scott R L	943 Madison av.	2-6881
Sparks C L	943 Madison av.	2-6881
Thompson "Bill"	943 Madison av.	2-6881
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## NEW FREE REFRIGERATION CATALOG



Thousands of replacement parts for practically every standard make of Refrigerator at lowest WHOLESALE Prices — as well as a line of Refrigerators incorporating the latest features and priced so that Servicemen can make a profit!

Gaskets, tubing, thermostats, evaporators, tools, and hundreds of other items are listed. No matter what you want in the Refrigeration Field we can supply it when you need it and at a price that will enable you to make a legitimate profit.

Get your Free Copy of this new Specialized Refrigeration Catalog.

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901 W. Jackson Blvd., Dept. RSE 46  
Chicago, Ill.

Please send me your Free Specialized Refrigeration Catalog.

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City \_\_\_\_\_ State \_\_\_\_\_

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CHICAGO, ILL ATLANTA, GA.  
901 W. JACKSON BLVD. 100 W. PEACHTREE ST. N.W.  
BRONX, N.Y. NEWARK, N.J.  
151 FORDHAM RD. 115 LEXINGTON AVE.

## MANUFACTURER'S NEWS

(Continued from page 39)

A Y-type strainer, one of the most notable of the new assemblies, has, according to the manufacturer, a negligible pressure drop, very large screen area, accessible cleanout flange, possesses a baffle to prevent damage to the screen, and is exceptionally light in weight.

The manufacturer states that ample screen area, accessibility for cleaning, minimum pressure drop, and compactness in design are the essential points to be observed in the selection of refrigerant strainers.

Evidence of compactness, without sacrifice of screen area, is illustrated by the use of a hemispherical screen assembly, instead of the usual flat screen disc in one type of small strainer. This design, according to the manufacturer, results in 50 per cent greater screen area.



"Y" type strainer. Negligible pressure drop. Easily cleaned.

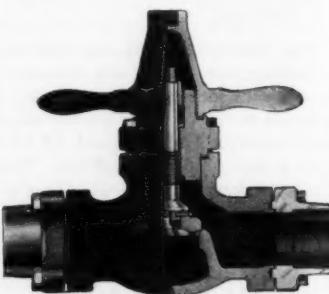
A feature of the wing cap valves is the closing or shut-off means employed. These valves, which were designed especially for "Freon," give perfect seating action with minimum force exerted on stem and minimum strain on valve body.

The stem is of two-piece construction. It is equipped with a patented, rotating, self-aligning, tapered disc, which is replaceable. This brass swivel disc is attached to the stem by means of three steel pins, which enter corresponding groove in stem. Pins are held in place by means of a spring retaining ring.

These valves are back-seated and may be repacked under pressure. A resilient packing, especially developed for "Freon," is used. No special wrenches are needed because the wing cap with socket provides a ready

means of operation. These valves are made with screw ends, or with streamline solder fittings, or with various types of companion flanges.

Companion flanges offer these important advantages: soldering or welding of pipe or tubing to flange can be accomplished without transmission of heat to the valve seat. Valves may also be readily removed from the line.



Wing cap line valve with companion flanges developed especially for "Freon." Made in sizes up to 6", inclusive.

Ease of setting is provided for in the new Henry "Freon" relief valves by means of the visible relief point indicator and adjustment screw. Both capped and hand wheel relief valves are made. The latter is a combination pressure relief valve and emergency blow-off valve. Lifting the valve stem, by turning the hand wheel counter-clockwise, rapidly discharges the refrigerant. Valves of emergency release type are necessary to meet the demands of certain local refrigeration installation ordinances being introduced throughout the country. All items illustrated have patents pending.

XXX

Carrasqueiro & Teixeira,  
Lisbon, Spain.

We find your magazine very interesting and a big help in our service department. All the articles are very interesting and contain a lot of valuable information.

R. Gerlack,  
Kentucky.

Every service man in the business should receive the REFRIGERATION SERVICE ENGINEER. I have been a subscriber since the first issue and I have been well repaid.

# EVERYTHING from ONE source

Your jobber of Perfection Certified Parts is prepared to render a very definite service. You can procure ALL your replacement parts and supplies through him, for he is the type that not only carries a stock of Perfection Certified Replacement Parts, but also everything else you may need to service any and all makes of refrigerators.

Many parts that have not previously been available for replacement or service needs from any independent source are made by Perfection. No premium is asked for these parts, yet they are manufactured of the finest materials, accurately machined and finished to insure easy installation, perfect fit and quiet operation.

Special attention is called to the fact that Perfection Products are not limited to a few fast moving numbers for one brand of refrigerator, but include a comprehensive line of compressor replacement parts for Copeland, Frigidaire, Kelvinator, Servel, Universal, Zerozone and others.

Order through the nearest Perfection jobber. If you do not know his name, please write us and we will gladly furnish complete information.

## PERFECTION REFRIGERATION PARTS CO.

(A division of Perfection Gear Co. Est. 1919)

HARVEY, ILLINOIS

**PERFECTION Certified Replacement Parts  
for popular makes of refrigeration units**



# COMMERCIAL REFRIGERATION

By L. K. WRIGHT

**A brand new book  
on the Application of  
Small Commercial  
Refrigeration Units to:**

**Markets  
Dairies  
Restaurants  
Bakeries  
Air Conditioning  
Ice Cream  
Drinking Water**

**for the use of:**

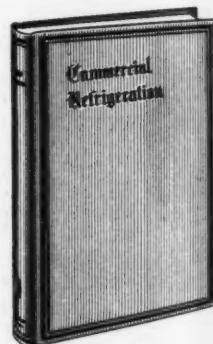
**Engineers  
Designers  
Estimators  
Salesmen  
Servicemen  
Students**

Over 400 pages . . .  
Size 6 x 9 inches . . . 147  
charts and illustrations  
. . . 150 tables.

**PRICE \$3.50**

**T**HIS new book covers the entire field of commercial refrigeration in the smaller installations. With it you are equipped to undertake practically any job, from the original estimate to the operation, and be *sure* you are following the most efficient and economical methods.

The detailed instructions are based on practical experience and actual installations, they tell you *how* to do the job without expensive mistakes and oversights.



**NICKERSON & COLLINS CO., Publishers  
435 N. Waller Ave., Chicago**

Enclosed find check (or money order) for \$..... for which please send me .... copies of COMMERCIAL REFRIGERATION at \$3.50 each, postpaid.

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ADDRESS .....

CITY ..... STATE .....

*The most  
Complete  
Line in the  
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Announcing New  
**HENRY DRYERS · STRAINERS  
and LARGE VALVES**  
for FREON and METHYL CHLORIDE

COMPLETE RANGE OF SIZES AND TYPES. VALVES TO 6-INCH INCLUSIVE

**STRAINERS**

Complete range  
of types, ca-  
pacities fitting  
sizes.

**Type 890  
Strainer**

Hemispherical  
Screen, with re-  
enforcement —  
50% more area.  
For small re-  
frigerat-  
ing plants.



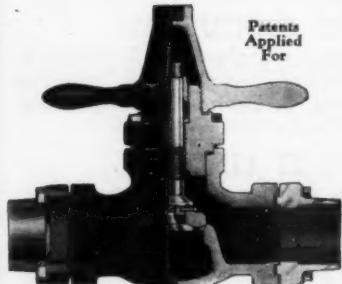
Patents  
Applied  
For



**Type 895 "Y"  
Strainer**

Negligible pressure  
drop. Accessible clean-  
out flange. Light  
weight.

Patents  
Applied  
For



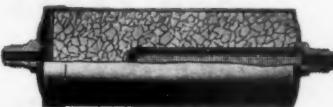
**WING CAP LINE VALVES  
For Freon & Methyl Chloride**

Designed especially for Freon. Equipped with our patented, rotating, self-aligning brass stem disc. Resilient packing. Back seating. When inverted wing cap and socket serve as wrench. Various types of companion flanges. Sizes up to 6", inclusive.

**DRYERS**

Patents Applied For

Various Types and Fitting Sizes. Dehydrant capacities range from 6.3 to 328 cu. in. Drawn copper shells with only one joint—either soldered or flanged. Dispersion tube exposes entire volume of dehydrant to penetration by refrigerant, resulting in only 10% of the pressure drop found in other dryers. Furnished with any one of five dehydrants.



**Type 712 Soldered Shell Dehydrator,  
with dispersion tube**



**Type 716 Flanged Shell Dehydrator  
with dispersion tube**



**Type 721 Dehydra-Tector**

*The dryer with the liquid sight port*

Gas bubbles passing under sight glass in-  
dicate shortage of refrigerant.

Write for new catalog, describing the com-  
plete Henry line of Strainers, Dryers, Wing  
Cap Valves and Relief Valves for Freon and  
Methyl Chloride. Also Service Tools.



DEALER-SEARCHED LINE SUPPLY YOU. WRITE DIRECT

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1005-19 North Spaulding Avenue  
CHICAGO · ILLINOIS

Again  
we ask  
you—

TRENTON AUTO RADIATOR WORKS, TRENTON, N. J.

Please send me at once your 1936 catalog on  
Refrigerating Equipment.

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R. S. E.

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—for the 1936

## KRAMER CATALOG ON REFRIGERATING EQUIPMENT

with B. T. U. Values and List Prices of all Coils  
at a glance, and short cuts in Engineering Com-  
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### IT DISCUSSES:

1. Heat Exchange Engineering.
2. Staggered Tubes.
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1. More than 1500 Coils for Walk-in Coolers
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9. Air and Water Cooled Condensers
10. Domestic Ice Cube Makers

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TRENTON, N. J.

5114 Liberty Ave., Pittsburgh, Pa.

# du Pont Announces Lower Price for

*Artic*  
REG. U. S. PAT. OFF.  
(DU PONT METHYL CHLORIDE)

The du Pont Company is pleased to announce that effective April 1, 1936, the price of ARTIC (Methyl Chloride) was reduced 5c per pound. Phone or write the nearest du Pont distributor for further information.

This price reduction is in line with the du Pont policy to pass on to the trade economies made in manufacturing and by increased use of its products.

The R. & H. Chemicals Department  
E. I. DU PONT DE NEMOURS & CO., INC.

Wilmington, Delaware

*District Sales Offices:* Baltimore, Boston, Charlotte, Chicago,  
Cleveland, Kansas City, Newark, New York, Philadelphia,  
Pittsburgh, San Francisco





**M**INNEAPOLIS-HONEYWELL Refrigeration Controls are easier to install, easier to service and easier to keep in adjustment. They are available in both wide and narrow ranges, temperature or pressure, and are suitable for all commercial refrigeration or comfort cooling applications. Visible scales, and locking and leveling devices included at no extra cost. Minneapolis-Honeywell Regulator Company, 2934 Fourth Ave. S., Minneapolis, Minn. Branches everywhere.

**MINNEAPOLIS-HONEYWELL**  
Control Systems